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THE JOURNAL

OF THE

American Medical Association

Subscription, $8.00 | PUBLISHED WEEKLY | Single Copies, 25 Cents

VOLUME 123, No. 15 | COPYRIGHT, 1943, BY AMERICAN MEDICAL ASSOCIATION 535 North Dearborn Street, Chicago 10, Ill. | DECEMBER 11, 1943

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A.M.A. Session CHICAGO *June 12-16, 1944*

Symposium on War Surgery

The December Number of the *Surgical Clinics of North America* features a *Symposium on War Surgery* which comes from the Walter Reed General Hospital, Washington, D.C., and the U. S. Naval Hospitals at San Diego, Oakland and Philadelphia.

The clinics in this Symposium are *based on actual experience* in treating the wounded in the theatres of operation and in the general hospitals. This Symposium is, therefore, vitally important to doctors in the Service and also of very special interest to the civilian doctor who will find many opportunities to benefit from these experiences and to use the technics of the Military Surgeon in treating his own patients.

For example, there are clinics on Treatment of Burns, on Blast Injuries, Traction Reduction of Fractures about the Wrist, Management of Acute Head Injuries, Use of Tantalum Wire and Foil in Repair of Peripheral Nerves, Treatment of Neurogenic Bladder after Acute Spinal Injury, Modern Pulmonary Resection in War Surgery, Care of Injured in Combat Zones, etc., etc.

In addition to the 14 clinics in the Symposium, there are included two other important clinics: The Use of Coagulum-Contact Method in Surgery and the Operative Repair of Complete Rectal Prolapse.

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THE JOURNAL of the American Medical Association is published weekly by the American Medical Association. 535 North Dearborn Street, Chicago 10, Ill. Subscription price, $8.00 a year. 25c a copy. Canadian $9.50. Foreign $12.00. Entered as second class matter June 25, 1885, at the Postoffice at Chicago, Ill., under Act of March 3, 1879.

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The Journal of the American Medical Association

Published Under the Auspices of the Board of Trustees

VOL. 123, No. 15 — CHICAGO, ILLINOIS — DECEMBER 11, 1943

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REPORT OF REEXAMINATION OF 4,994 MEN DISQUALIFIED FOR GENERAL MILITARY SERVICE

BECAUSE OF THE DIAGNOSIS OF CARDIOVASCULAR DEFECTS

A COMBINED STUDY MADE BY SPECIAL MEDICAL ADVISORY BOARDS IN BOSTON, CHICAGO, NEW YORK, PHILADELPHIA AND SAN FRANCISCO

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Much has been written about the physical fitness of men for active military service, and in many countries criteria have been drawn up to guide examiners in the choice of suitable candidates. Borderline cases and the range of the normal have furnished abundant material for discussion; but in the cardiovascular field, in particular, there is still a great deal to be learned. Two aspects of the problem which might aid in its clarification have not been explored adequately, namely the reexamination, by expert cardiologists, of a relatively large group of registrants rejected for cardiovascular defects, and a long follow-up of the borderline cases. The present study will deal with the first of these; it should also provide material for the pursuit of the second, which we hope may form the basis of another report several years hence. The major questions presented have involved the significance of heart murmurs, the critical levels of blood pressure and heart rate, the importance of certain arrhythmias and the diagnosis of neurocirculatory asthenia. Chamberlain [1] in England and Markson and Gethner [2] in this country, who reported on the analysis of cases referred for cardiovascular opinion by recruitment medical boards, were confronted by similar difficulties.

Following a statistical survey made by the Selective Service System, it was estimated that 100,000 registrants of the first 2 million examined were unqualified for general military service because of cardiovascular diseases. Only for defects of the teeth and eyes were greater numbers rejected. One million of the first 2 million examined were rejected for all causes.[3]

The group disqualified for disorders of the heart and circulation thus accounted for approximately 10 per cent of all rejectees. This rate seemed excessive for men between the ages of 18 and 38 years. In order to discuss this problem a meeting of the Subcommittee on Cardiovascular Diseases of the National Research Council was held at the National Academy of Sciences Building in Washington, D. C., on June 27, 1942. The following were present: Drs. Paul D. White, chairman, Edgar van Nuys Allen, Robert L. Levy, William D. Stroud and Irving S. Wright, all of the subcommittee; Brig. Gen. C. C. Hillman, Col. H. J. Morgan, Lieut. Col. J. G. Knauer and Capt. L. H. Warren, representing the Army; Lieut. Commander Ashton Graybiel, representing the Navy; Dr. O. F. Hedley, representing the U. S. Public Health Service; Col. L. G. Rowntree, Col. R. H. Eanes, Major Robert Bier and Major O. H. Folk, representing the Selective Service System; Drs. L. H. Weed, W. C. Davison, S. V. Larkey, T. R. Forbes, G. A. Carden and Commander E. H. Cushing, representing the National Research Council; Drs. A. N. Richards and E. C. Andrus, representing the Committee on Medical Research, and Dr. R. A. Wolford, representing the Veterans' Administration.

As a result of this conference a letter was sent to Major Gen. Lewis B. Hershey, Director of Selective Service, by Drs. Levy, Stroud and White, proposing a project for the reexamination, by boards of cardiologists in each of five cities, of 1,000 registrants rejected for cardiovascular reasons. Through such a study it seemed possible, and indeed probable, that a number of men might be salvaged, to the advantage of both the Army and themselves, and that information might be gained which would prove useful in subsequent induction examinations. The proposal was promptly approved by General Hershey, and it was agreed that Selective Service would stand the expense of necessary laboratory examinations and the printing of record forms.

A more detailed account of the individual city reexamination studies, embodied in their reports, will be published in a forthcoming issue of the American Heart Journal.

The work described in this paper was done under a contract, recommended by the Committee on Medical Research, between the Office of Scientific Research and Development and the University of Pennsylvania; and under the auspices of National Headquarters, Selective Service System, Washington, D. C.

Col. Leonard G. Rowntree, chief of the Medical Division, National Headquarters, Selective Service System, furnished aid in initiating and continuing this study. The medical directors of Selective Service in the localities in which the examinations were made rendered invaluable help, without which the work could not have been carried forward successfully. This co operation was extended by Lieut. Col. Victor D. Washburn, medical officer for Massachusetts; Lieut. Col. E. Mann Hartlett, medical officer for Illinois; Col. Samuel J. Kopetzky, chief of the Medical Division in New York City; Lieut. Col. Edgar S. Everhart, medical officer for Pennsylvania, and Lieut. Col. Bert S. Thomas, medical officer for California. The chairmen of the special medical advisory boards in Chicago and San Francisco, Drs. G. K. Fenn and William J. Kerr, respectively, submitted full reports, the contents of which form part of this combined study. All who participated in the project—physicians, secretaries, technicians and aides—gave generously of their time and services. Miss Dorothy Kurtz, supervisor of the Record Department, Presbyterian Hospital, New York City, assisted in the preparation of the combined statistical tables.

1. Chamberlain, E. N.: The Recruit's Heart, Brit. M. J. **1**: 354 (March 8) 1941.
2. Markson, D. E., and Gethner, M. P.: An Analysis of Cardiac Abnormalities in 460 Selectees, Illinois M. J. **82**: 350 (Nov.) 1942.
3. Rowntree, L. G.: Rehabilitation and Prehabilitation, J. A. M. A. **119**: 1171 (Aug. 8) 1942.

The remaining cost was defrayed by a contract between the Office of Scientific Research and Development and the University of Pennsylvania, recommended by the Committee on Medical Research with the advice of the National Research Council. Dr. Stroud was appointed chairman of the study.

PLAN OF PROCEDURE

It was decided that the pilot tests should be made in each of five cities with a large university medical center where a sufficient number of cardiologists would be available. Boston, Chicago, New York, Philadelphia and San Francisco were designated for the study of 1,000 rejectees each. The state directors of Selective Service in New York, Pennsylvania, Massachusetts, Illinois and California appointed the following special medical advisory boards for this project:

Boston: Senior examiners, Drs. Norman H. Boyer, Laurence Ellis, Burton E. Hamilton, Samuel A. Levine and Paul D. White, chairman. Assistant examiners, Drs. Mandel E. Cohen (also neuropsychiatrist), James Currens, Elwyn Evans and Conger Williams.

Chicago: Drs. Joseph A. Capps, N. C. Gilbert, Max Gethner, Sidney Strauss, J. Roscoe Miller, George H. Coleman, Frank B. Kelly, Lawrence E. Hines, Stanley Gibson, Carl O. Rinder, Howard Wakefield, G. K. Fenn, chairman, and James B. Herrick, honorary chairman.

New York: Senior examiners, Drs. Arthur C. DeGraff, Clarence E. de la Chapelle, B. S. Oppenheimer, Harold E. B. Pardee, Howard F. Shattuck and Robert L. Levy, chairman. Assistant examiners, Drs. John M. Baldwin Jr., Adolph R. Berger, Edwina Campbell, John L. Caughey Jr., William M. Hitzig, Donald D. Parker and Grant Sanger.

Philadelphia: Drs. Samuel Bellet, George C. Griffith, Thomas M. McMillan, George Morris Piersol and William D. Stroud, chairman.

San Francisco: Drs. E. L. Bruck, F. L. Chamberlain, J. K. Lewis, J. M. Read, J. J. Sampson, Paul Gliebe, Mayo H. Soley, Earl R. Miller and William J. Kerr, chairman. Also resident staff and interns in medicine and roentgenology.

A special record form was designed and was used in all the examinations. It proved satisfactory and is herewith reproduced (fig. 1).

TABLE 1.—*Result of Reexamination by Special Boards*

	Number of Cases						Percentage of Total Cases Examined					
	Total Five Cities	Boston	Chicago	New York	Philadelphia	San Francisco	Total Five Cities	Boston	Chicago	New York	Philadelphia	San Francisco
Total cases examined	4,994	1,000	1,000	1,000	1,035	959	100.0	100.0	100.0	100.0	100.0	100.0
Cases resubmitted	863	188	38	192	171	274	17.3	18.8	3.8	19.2	16.5	28.6
Cases finally rejected	4,131	812	962	808	864	685	82.7	81.2	96.2	80.8	83.5	71.4

TABLE 2.—*Result According to Original Rejection Diagnoses*

(By Local Board or Induction Station)

	Number of Cases															Percentage of Each Diagnosis Finally Resubmitted				
	Four Cities *			Boston			Chicago			New York			Philadelphia							
		Finally			Finally			Finally			Finally			Finally						
Original Diagnoses	Total	Resubmitted	Rejected	Total	Resubmitted	Rejected	Total	Resubmitted	Rejected	Total	Resubmitted	Rejected	Total	Resubmitted	Rejected	Total Four Cities*	Boston	Chicago	New York	Philadelphia
Total cases examined	4,035	589	3,446	1,000	188	812	1,000	38	962	1,000	192	808	1,035	171	864	14.6	18.8	3.8	19.2	16.5
Rheumatic valvular heart disease	2,344	299	2,045	503	79	424	559	14	545	635	109	526	647	97	550	12.8	15.7	2.5	17.2	15.0
Hypertension	856	133	723	263	52	211	141	5	136	192	43	149	260	33	227	15.5	19.8	3.5	22.4	12.7
Tachycardia	275	51	224	31	2	29	99	8	91	96	27	69	49	11	35	18.5	6.5	8.1	28.1	28.6
Congenital heart disease	77	7	70	31	5	26	17	0	17	18	1	17	11	1	10	9.1	16.1	0.0	5.6	9.1
Cardiac hypertrophy	197	19	178	68	0	68	64	2	62	55	12	43	10	5	5	9.6	0.0	3.1	21.8	50.0
Rheumatic fever, recent	13	4	9	9	3	6	1	0	1	1	0	1	2	1	1	30.8	33.3	0.0	0.0	50.0
Heart disease, unspecified	380	71	309	96	27	69	159	12	147	87	20	67	38	12	26	18.7	28.1	7.5	23.0	31.6
Neurocirculatory asthenia	92	22	70	76	17	59	0	0	0	9	1	8	7	4	3	23.9	22.4	...	11.1	57.1
Cardiac arrhythmia	30	6	24	6	2	4	13	1	12	8	1	7	3	2	1	20.0	33.3	7.7	12.5	66.7
Cardiac neurosis	5	1	4	4	0	4	0	0	0	0	0	0	1	1	0	20.0	0.0	...	....	100.0
Syphilis of aorta	5	0	5	0	0	0	2	0	2	0	0	0	3	0	3	0.0	...	0.0	....	0.0
Aneurysm of aorta	1	0	1	0	0	0	0	0	0	1	0	1	0	0	0	0.0	...	...	0.0	...
Aneurysm other than aorta	1	0	1	0	0	0	0	0	0	1	0	1	0	0	0	0.0	...	...	0.0	...
Heart disease due to chest deformity	3	0	3	1	0	1	0	0	0	2	0	2	0	0	0	0.0	0.0	...	0.0	...
Coronary heart disease	5	1	4	3	1	2	1	0	1	1	0	1	0	0	0	20.0	33.3	0.0	0.0	...
Electrocardiographic abnormality only	5	0	5	0	0	0	5	0	5	0	0	0	0	0	0	0.0	...	0.0	...	...
Peripheral vascular disease	1	0	1	1	0	1	0	0	0	0	0	0	0	0	0	0.0	0.0	...	...	...
Pericarditis	4	0	4	1	0	1	3	0	3	0	0	0	0	0	0	0.0	0.0	0.0	...	...
Nephritis (persistent albuminuria)	9	0	9	6	0	6	1	0	1	0	0	0	2	0	2	0.0	0.0	0.0	...	0.0
Hyperthyroidism	13	1	12	2	0	2	9	0	9	0	0	0	2	1	1	7.7	0.0	0.0	...	50.0

* No figures available for San Francisco.

The results of the study are summarized in tables 1 to 9.

COMMENT

1. *General Plan of Reexamination.*—The reexamination of men rejected for military service on the basis of cardiovascular defects or neurocirculatory asthenia was undertaken with four purposes in mind. In the first place, a more detailed analysis of the problems in cardiovascular diagnosis and of the range of the normal heart was desired to point the way for further follow-up study and research. Secondly, it was important to know the possible amount of salvage of men for military service in this particular field. Thirdly, a comparison of the opinions of cardiovascular experts with those of

the examiners in the local boards and induction stations concerning large groups of men thought to have heart disease was desired as a pioneer research to determine the feasibility of such reexaminations in other special medical fields, or in the same field in other parts of the country. And, finally, an additional, though minor, point of interest was a brief inquiry as to the ability of the men whose rejections were confirmed to carry on in civilian life.

A sample of 5,000 men was considered adequate for this reexamination. The northeast part of the country (Boston, New York and Philadelphia), the middle west (Chicago) and the far west (San Francisco) were represented. It had been hoped to include one of the southern cities, but this did not prove to be feasible although it would be of interest some day to make such a survey in the South. An extension of the study to include the country more generally, that is by individual states, cities or districts, was thought of as a later possibility dependent on the results of this preliminary study but was not definitely planned.

2. *Personnel, Technic and Arrangements for Reexamination.*—Following the criteria of admission to the Army outlined in Mobilization Regulations (MR) 1-9, paragraphs 60-67, and a directive sent out by the chairman of this particular research committee the technic of reexamination was essentially the same in the five cities. Examinations were carried out in large general hospitals where the facilities were adequate (Massachusetts General Hospital in Boston, St. Luke's Hospital in Chicago, Presbyterian Hospital in New York City, Pennsylvania Hospital in Philadelphia and University of California Hospital in San Francisco). It is evident from the list of special examiners given in the preceding section that cardiovascular experts of recognized ability and experience were available and volunteered their services in each of the five cities. To assist them the services of junior medical volunteers were obtained, along with adequate secretarial and technical help and volunteer aides.

There was a uniformity of arrangements in plans for examination in the various cities. The men to be examined were gathered from numerous local boards in and near the central part of these various metropolitan areas with the helpful cooperation of the local board examiners and of the central induction stations. The majority of the men (about two thirds) had been turned down by the induction stations in the year 1942. Several weeks, ranging from four to eight, were required for completion of the reexaminations in the different cities, and from 40 to 110 men were examined at the different sessions, averaging 60 to 70 at a time. The examinations were usually conducted in the evenings, two or three days a week, and on Saturday afternoons.

The actual examinations were carried on mainly in the recumbent position but often in the upright position too, for comparison, and by at least two examiners. If men were considered suitable for resubmission as 1A they were checked by at least two of the senior examiners and were routinely electrocardiographed and submitted to the x-ray department of the various hospitals for teleoroentgenograms (2 meter films) before the decision to resubmit as 1A was finally made. Less time was required in the examination of those men whose rejection was confirmed, but in these also interesting data were obtained, as presented in the tables and as will be discussed later. An example is the incidence of a positive rheumatic history among those with rheumatic heart disease.

TABLE 3.—*Final Diagnoses in Cases Rejected by Special Boards*

Diagnoses	Number of Cases						Percentage of Cases Finally Rejected					
	Total Five Cities	Boston	Chicago	New York	Philadelphia	San Francisco	Total Five Cities	Boston	Chicago	New York	Philadelphia	San Francisco
Total finally rejected	4,131	812	962	808	864	685	100.0	100.0	100.0	100.0	100.0	100.0
Rheumatic valvular heart disease	2,476	415	676	545	569	271	59.9	51.1	70.3	67.4	65.9	39.6
Hypertension	1,059	249	239	150	200	212	25.6	30.7	24.8	19.7	23.1	30.9
Tachycardia	189	32	75	48	8	26	4.6	3.9	7.8	5.9	0.9	3.8
Congenital heart disease	183	45	28	29	18	63	4.4	5.5	2.9	3.6	2.1	9.2
Syphilis of aorta	17	0	5	7	3	2	0.4	0.0	0.5	0.9	0.3	0.3
Aneurysm other than aorta	1	0	0	1	0	0	0.0	0.0	0.0	0.1	0.0	0.0
Cardiac enlargement only	76	12	9	20	9	26	1.8	1.5	0.9	2.5	1.0	3.8
Myocarditis, chronic rheumatic	6	0	1	5	0	0	0.1	0.0	0.1	0.6	0.0	0.0
Coronary heart disease	6	1	0	2	0	3	0.1	0.1	0.0	0.2	0.0	0.4
Heart disease, unspecified	113	14	28	1	0	70	2.7	1.7	2.9	0.1	0.0	10.2
Neurocirculatory asthenia	204	78	11	31	54	30	4.9	9.6	1.1	3.8	6.3	4.4
Auricular fibrillation, paroxysmal	4	1	1	2	0	0	0.1	0.1	0.1	0.2	0.0	0.0
Auricular fibrillation, permanent	50	15	11	11	9	4	1.2	1.8	1.1	1.4	1.0	0.6
Paroxysmal tachycardia	17	5	1	5	0	6	0.4	0.6	0.1	0.6	0.0	0.9
Cardiac arrhythmia only *	15	0	5	3	0	7	0.4	0.0	0.5	0.4	0.0	1.0
Cardiac neurosis	11	5	0	0	0	6	0.3	0.6	0.0	0.0	0.0	0.9
Recent rheumatic fever	13	6	4	0	0	3	0.3	0.7	0.4	0.0	0.0	0.4
Pericarditis	4	0	0	0	0	4	0.1	0.0	0.0	0.0	0.0	0.6
Heart disease due to chest deformity	10	2	0	5	0	3	0.2	0.2	0.0	0.6	0.0	0.4
Electrocardiographic abnormality only	32	6	5	5	3	13	0.8	0.7	0.5	0.6	0.3	1.9
Peripheral vascular disease	3	0	0	1	0	2	0.1	0.0	0.0	0.1	0.0	0.3
Nephritis (persistent albuminuria)	6	1	1	0	0	4	0.1	0.1	0.1	0.0	0.0	0.6
Hyperthyroidism	14	1	10	1	0	2	0.3	0.1	1.0	0.1	0.0	0.3

* Exclusive of paroxysmal tachycardia.

TABLE 4.—*Disposition and Final Diagnoses of Borderline Cases*

Diagnoses	Number of Cases					
	Total Five Cities	Boston	Chicago	New York	Philadelphia	San Francisco
Total borderline cases	217	114	2	15	36	50
Cases resubmitted	103	0	2	15	36	50
Cases finally rejected	114	114	0	0	0	0
Rheumatic valvular heart disease	19	19	0	0	0	0
Hypertension, "nervous"	109	70	0	8	0	31
Tachycardia, "nervous"	52	27	0	6	0	19
Congenital heart disease	2	2	0	0	0	0
Cardiac enlargement only	48	10	2	0	36	0
Heart disease, unspecified	1	1	0	0	0	0
Neurocirculatory asthenia	2	2	0	0	0	0
Recent rheumatic fever	1	0	0	1	0	0
Electrocardiographic abnormality only	2	2	0	0	0	0

One of the interesting and important developments in all the cities was the frequent consultation among the examiners concerning individual cases and moot points of diagnosis. The significance of certain findings such as the systolic click and the late systolic murmur was discussed at such sessions and a number of other matters were listed for follow-up when it was agreed that there was inadequate knowledge at the present time about them. It is hoped that these various teams or their successors may be able, in the course of the years to come, to study these various points further, with particular reference to the individuals examined during this study.

TABLE 5.—*Types of Rheumatic Valvular Heart Disease in Rejected Cases*

(Final Diagnoses by Special Boards)

Specific Types	Number of Cases						Percentage of Total Rheumatic Valvular Disease					
	Total Five Cities	Boston	Chicago	New York	Philadelphia	San Francisco	Total Five Cities	Boston	Chicago	New York	Philadelphia	San Francisco
Total rheumatic valvular disease	2,476	415	676	545	569	271	100.0	100.0	100.0	100.0	100.0	100.0
Mitral regurgitation alone *	750	71	155	190	308	26	30.3	17.1	22.9	34.9	54.1	9.6
Mitral stenosis alone *	750	101	295	157	131	66	30.3	24.3	43.6	28.8	23.0	24.4
Aortic regurgitation alone †	208	53	37	35	4	79	8.4	12.8	5.5	6.4	0.7	29.1
Aortic stenosis alone †	72	19	10	3	0	40	2.9	4.6	1.5	0.6	0.0	14.8
Combined mitral and aortic disease	628	161	127	160	126	54	25.4	38.8	18.8	29.3	22.2	19.9
Valve unspecified	68	10	52	0	0	6	2.7	2.4	7.7	0.0	0.0	2.2

* Without aortic valve disease. † Without mitral valve disease.

TABLE 6.—*History of Rheumatic Fever or Chorea in Rejected Cases with Rheumatic Valvular Heart Disease*

History	Number of Cases					Percentage of Total Rheumatic Valvular Disease				
	Total Four Cities *	Boston	Chicago	New York	Philadelphia	Total Four Cities *	Boston	Chicago	New York	Philadelphia
Total rheumatic valvular disease	2,205	415	676	545	569	100.0	100.0	100.0	100.0	100.0
History of rheumatic fever	634	190	98	257	89	28.8	45.8	14.5	47.2	15.6
History of chorea	40	9	3	24	4	1.8	2.2	0.4	4.4	0.7
History of both rheumatic fever and chorea	13	0	0	13	0	0.6	0.0	0.0	2.4	0.0

* No figures available for San Francisco.

TABLE 7.—*Types of Congenital Heart Disease in Rejected Cases*

(Final Diagnoses by Special Boards)

Specific Types	Number of Cases						Percentage of Total Congenital Heart Disease					
	Total Five Cities	Boston	Chicago	New York	Philadelphia	San Francisco	Total Five Cities	Boston	Chicago	New York	Philadelphia	San Francisco
Total congenital heart disease	183	45	28	29	18	63	100.0	100.0	100.0	100.0	100.0	100.0
Patent ductus arteriosus	29	3†	6	7	4	9	15.8	6.7	21.4	24.1	22.2	14.3
Patent ductus and pulmonary stenosis	1	0	0	0	1	*	0.5	0.0	0.0	0.0	5.6	*
Patent ductus and interventricular septal defect	4	0	0	4	0	*	2.2	0.0	0.0	13.8	0.0	*
Defect of interventricular septum	73	21	9	12	5	26	39.9	46.6	32.1	41.4	27.8	41.3
Defect of interauricular septum	6	5	0	0	0	1	3.3	11.1	0.0	0.0	0.0	1.6
Subaortic stenosis	5	4	0	1	0	0	2.7	8.9	0.0	3.4	0.0	0.0
Tetralogy of Fallot	2	1	0	1	0	0	1.1	2.2	0.0	3.4	0.0	0.0
Coarctation of aorta	14	3	2	1	0	8	7.7	6.7	7.1	3.4	0.0	12.7
Pulmonic stenosis	13	3	0	0	9	1	7.1	6.7	0.0	0.0	50.0	1.6
Dextrocardia	2	0	1	1	0	0	1.1	0.0	3.6	3.4	0.0	0.0
Low aorta-pulmonary artery communication	1	1	0	0	0	0	0.5	2.2	0.0	0.0	0.0	0.0
Prominent pulmonary artery	1	1	0	0	0	*	0.5	2.2	0.0	0.0	0.0	*
Unspecified type	34	3	11	3	0	17	18.6	6.7	39.3	10.3	0.0	27.0

* No data compiled for these in San Francisco. † One case cured by ligation.

3. *The Men Reexamined.*—The total number of rejectees examined in the five cities equaled 5,127 men. Of this number 133 were omitted for statistical purposes because they were rejectable for other than cardiovascular reasons, leaving 4,994 for the complete statistical study. In each city, as a rule, a surplus, that is, some few over the 1,000, were examined in order to make allowances for cases unsuitable for the study. In Boston 1,015 were so examined in order to obtain 1,000; in Chicago 1,082 were examined and 1,000 retained; in New York there were 1,014 in order to obtain the even 1,000 for the study; in Philadelphia there were 1,035 with 1,035 included in the statistical study; in San Francisco 983 were examined but 24 were rejectable for other than cardiovascular reasons, leaving 959.

The great majority of the men were white but of a great variety of national stocks including English, Scotch, Irish, Dutch, French, Italian, German and Scandinavian. There were a good many Negroes (table 8), varying much in numbers in different cities. In Boston there were only 23 Negroes; in Chicago there were 66; in New York there were 90 Negroes, making up 9 per cent of the total, and in Philadelphia there were 207 Negroes, approximately 20 per cent of the

total. Thus, in these four cities the Negro percentage was just under 10 (9.6 per cent). There were a few Chinese (1 in Boston and 5 in New York). The relatively high percentage of rejection of Negroes and Chinese is of interest. The rejection of all the Chinese in Boston and New York in this series was confirmed, and the rejection of the Negroes was confirmed in a higher percentage than in the case of the white persons in the three eastern cities. In Boston 22 of the 23 Negroes were rejected, compared with a proportion of decade as compared with the fourth among the rejectees was almost exactly three to one, in contrast to the two to one total ratio of the two decades, while the ratio of the hypertensive rejectees was just reversed, being almost exactly one to three (in the third decade as compared to the fourth). There was a slight preponderance of cases of neurocirculatory asthenia in the third decade, in Boston 44 to 17, as compared with the grand total of 648 to 352 men in the third and fourth decades.

TABLE 8.—*Distribution of Certain Final Diagnoses by Race*

	Number of Cases																Percentage of Finally Rejected Cases Four Cities *			
	Four Cities *				Boston				Chicago				New York				Philadelphia							
Diagnoses	White	Negro	Chinese	Filipino	White	Negro	Chinese	Filipino	White	Negro	Chinese	Filipino	White	Negro	Chinese	Filipino	White	Negro	Chinese	Filipino	White	Negro	Chinese	Filipino
Total cases examined	3,639	386	6	4	976	23	1	0	939	66	0	4	905	90	5	0	828	207	0	0				
Total cases resubmitted	543	46	0	0	187	1	0	0	38	0	0	0	180	12	0	0	138	33	0	0				
Total cases rejected	3,096	340	6	4	789	22	1	0	892	66	0	4	725	78	5	0	690	174	0	0	100.0	100.0	100.0	100.0
Rheumatic valvular disease	1,979	217	5	4	407	7	1	0	620	52	0	4	494	47	4	0	458	111	0	0	63.9	63.8	83.3	100.0
Hypertension	716	131	0	0	237	12	0	0	192	47	0	0	141	18	0	0	146	54	0	0	23.1	38.5	0.0	0.0
Tachycardia	148	15	0	0	32	0	0	0	62	13	0	0	46	2	0	0	8	0	0	0	4.8	4.4	0.0	0.0
Neurocirculatory asthenia	171	3	0	0	77	1	0	0	11	0	0	0	31	0	0	0	52	2	0	0	5.5	0.9	0.0	0.0
Congenital heart disease	113	7	0	0	45	0	0	0	28	0	0	0	27	2	0	0	13	5	0	0	3.6	2.1	0.0	0.0
Syphilis of aorta	6	9	0	0	0	0	0	0	5	0	0	0	0	7	0	0	1	2	0	0	0.2	2.6	0.0	0.0
Coronary heart disease	3	0	0	0	1	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0.1	0.0	0.0	0.0
Permanent auricular fibrillation	46	0	0	0	15	0	0	0	11	0	0	0	11	0	0	0	9	0	0	0	1.5	0.0	0.0	0.0
Paroxysmal tachycardia	10	1	0	0	5	0	0	0	0	1	0	0	5	0	0	0	0	0	0	0	0.3	0.3	0.0	0.0

* No figures available for San Francisco.

TABLE 9.—*Miscellaneous Data*

	Number of Cases						Percentage of Total Cases Finally Resubmitted or Rejected					
Classifications	Total † Four Cities	Boston	Chicago	New York	Philadelphia	San Francisco	Total † Four Cities	Boston	Chicago	New York	Philadelphia	San Francisco
Total cases finally resubmitted	589	188	38	192	171	274	100.0	100.0	100.0	100.0	100.0	100.0
Cases resubmitted with unexplained (non-pathologic) apical systolic murmurs	176	48	8	99	21	*	29.9	25.5	21.1	51.6	12.3	*
Cases resubmitted with unexplained (non-pathologic) aortic systolic murmurs	15	6	4	5	0	*	2.5	3.2	10.5	2.6	0.0	*
Total cases finally rejected	3,446	812	962	808	864	685	100.0	100.0	100.0	100.0	100.0	100.0
Cases in which the electrocardiogram was the deciding factor in final rejection diagnosis	48	26	5	14	3	17	1.4	3.2	0.5	1.7	0.3	2.3
Cases in which x-ray examination of the heart was the deciding factor in final rejection diagnosis	99	29	12	49	9	26	2.9	3.6	1.2	6.1	1.0	3.8
Cases in which original rejection diagnosis agreed with final rejection diagnosis	2,535	592	702	639	602	*	73.6	72.9	73.0	79.1	69.7	*
Cases in which there was disagreement between original and final rejection diagnoses	631	168	113	88	262	*	18.3	20.7	11.7	10.9	30.3	*
Cases in which incomplete original diagnosis made comparison impossible	280	52	147	81	0	*	8.1	6.4	15.3	10.0	0.0	*
Original rejection diagnoses with which the final diagnoses most frequently disagreed (1) valvular heart disease, (2) hypertension, (3) tachycardia, (4) neurocirculatory asthenia, in order of frequency of disagreement		1 2 4	1 2 3	1 2 3	1 2 3	*						

† San Francisco excluded because data incomplete. * No data compiled for these in San Francisco.

about 7 out of 10 of the whites. In Chicago all 66 were rejected, in New York 78 of the 90, and in Philadelphia 174 of the 207. There were a few Filipinos, also with a high percentage of rejection.

The majority of the men were in the age group of the third decade, amounting both in Boston and in New York, for example, to 65 per cent. The remainder were mostly in the fourth decade, with a few just under 20. It is of interest in this connection that rheumatic heart disease was preponderant among the younger men, that is, in the third decade, in contrast to hypertension, which was preponderant in the fourth decade. In Boston the ratio of rheumatic heart disease in the third

The majority of the men had been rejected by the induction stations but the figures varied widely. In Boston the ratio was about 2 to 1; in New York the proportion was 506 to 494. As was to be expected, the rejections made by the induction stations were more often sustained than those which were made by the local boards.

In New York the greater number (60.4 per cent) of men resubmitted for service had been rejected by the local draft boards, while the remainder (39.6 per cent) had been rejected by the induction station. Many local boards contributed to this study, comprising fifty-four in Greater Boston including Cambridge, Somerville and

other adjacent cities and towns, fifty-two in the city of Chicago, one hundred and twenty-three local boards scattered through the boroughs of Manhattan and the Bronx in New York, 33 in the central part of Philadelphia, and many local boards in San Francisco,[4] Berkeley and Oakland.

The great bulk of all these rejectees reexamined were city dwellers, living in or close to the five metropolitan areas where the studies were carried on. This was for the sake of convenience. Rural draftees were therefore considerably in the minority in this study.

4. *Criteria for Reclassification as 1A and 4F.*—In general, the criteria listed in Mobilization Regulations (MR 1-9) were followed quite literally in this reexamination, and because many are unfamiliar with this document its passages pertinent to the heart and blood vessels are listed here. As in the case of the majority of the local boards and induction stations there was some, but not great, latitude in the interpretation of murmurs, heart rate, blood pressure, electrocardiograms and x-ray films.

App. not Req.

SPECIAL EXAMINATION OF REJECTEES WITH CARDIOVASCULAR DEFECTS

(Local Board Date Stamp With Case)

	Do Not Write in This Space
I. GENERAL (to be filled in by the local board clerk from the registrant's latest report of physical examination, Form 200 or 221).	
1. Name ..... 2. Order No.	(1)
3. Address	
4. Birth date ..... 5. Race: White ☐ Negro ☐ Other (specify)	(2)
6. Occupation	
7. Rejected at: Local board ☐ Induction station ☐ 8. Date of rejection	(3)
9. Cause of rejection	(4)
II. CARDIOVASCULAR EXAMINATION RESULTS (to be filled in by the examining physician. All items must be filled in. Indicate none where applicable).	(5)
10. Symptoms	(6)
11. Past history of:	
(a) Rheumatic fever or chorea	(7)
(b) Heart disease	(8)
(c) Paroxysmal tachycardia	
12. Present findings: (e) Heart sounds:	
(a) Pulse rate: Recumbent ..... Normal ☐ Abnormal ☐	(9)
After 30 minutes' rest ..... (f) Murmurs:	
(b) Blood pressure: Recumbent ..... Apical: Systolic ☐ Diastolic ☐ Presystolic ☐	(10)
After 30 minutes' rest ..... Aortic: Systolic ☐ Diastolic ☐ Other	
(c) Heart size: Normal ☐ Enlarged ☐ (specify)	(11)
(d) Heart rhythm: Normal ☐ (g) Cyanosis ☐ Clubbing ☐ Edema ☐	
Abnormal: Extrasystoles ☐ Heart (h) Height (in. without shoes)	(12)
block ☐ Auricular fibrillation ☐ (i) Weight (lbs. without coat or shirt)	
Other (specify)	(13)
13. X-ray (2-meter film)	(14)
Fluoroscopy (optional)	
14. Electrocardiogram	(15)
15. Other observations (only if indicated)	(16)
(a) Blood	(17)
(b) Urine	
(c) Exercise test	(18)
16. Final diagnosis	
17. Recommendations	(19)
18. Date ..... 19. Physician's signature	(20)
III. LOCAL BOARD ACTION:	(21)
20. Registrant (was—was not) forwarded to the induction station after special examination. If forwarded, was (accepted—rejected) [Strike out words not applicable.]	(22)
21. Signature of member or clerk of local board	(23)
(See Instructions on Reverse Side)	
Form 221a (3-4-43)	(24)

Fig. 1.—Record form used in examinations. The instructions on the reverse side were as follows:

1. An original and three copies of this form will be prepared for each registrant called up for special examination by cardiologists.

2. If the registrant is forwarded to the induction station, the original of this form will accompany Form 221. If the registrant is not sent to the induction station, the original of this form will be retained in the registrant's Cover Sheet (Form 53), or if the registrant is rejected at the induction station this original will be returned to the local board and placed in the registrant's Cover Sheet (Form 53).

3. The first and second carbon copies will be forwarded to the Director of Selective Service, Washington, D. C., for all registrants examined, through the State Director of Selective Service.

4. The third carbon copy will be retained in the local board for all registrants examined.

4. To supplement the metropolitan area of San Francisco, some men were drawn from Oakland and Berkeley.

Mobilization Regulations
No. 1-9

War Department,
Washington, October 15, 1942.

STANDARDS OF PHYSICAL EXAMINATION DURING MOBILIZATION

Section XIV

Heart, Blood Vessels and Circulation

62. General service.—a. A heart will be considered normal when the apex impulse is within the left midclavicular line and not below the fifth interspace; when sounds are normal and there are no thrills or important murmurs; when there is no abnormal pulsation or dulness above the base of the heart; when pulse rate is normal and regular and there is no unusual thickening of the arteries or significant elevation of blood pressure.

b. A pulse rate of 100 or over which is not persistent and not due to paroxysmal tachycardia. (A pulse rate of 100 or over may be temporary and due to excitement or to recent infection, such as pneumonia or local infections about the nose, mouth and throat or may be induced by drugs.)

c. A pulse rate of 50 or under which is proved to be the natural pulse rate of the individual or to be temporary or due to the use of drugs. (If the bradycardia is physiological, the rate on exercise will rise to a higher level and then gradually return to the original slow rate; whereas when heart block is present the rate on exercise will either change slightly or not at all or sudden interruptions in the length of the heart cycle will be detected.)

d. Sinus arrhythmia. (This consists in a quickening of the pulse rate during inspiration and a slowing during expiration and is best recognized with the individual recumbent and breathing deeply.)

e. Elevation of blood pressure from excitement, proved to be temporary.

f. Neurocirculatory asthenia, if very mild in degree.

63. Limited service.—There are no cardiovascular criteria to warrant initial selection for limited service.

64. Nonacceptable.—a. Circulatory failure evidenced by definite symptoms such as undue breathlessness, pain or evidence of congestive failure (engorged neck veins, enlarged liver, edema, as well as dyspnea).

b. Hypertrophy and/or dilatation of the heart evidenced by displacement of the apex impulse to the left of the midclavicular line or below the sixth rib, and of a heaving or diffuse character, or by x-ray evidence.

c. A persistent heart rate of 100 or over when this is proved to be persistent in the recumbent posture and on observation and reexamination over a sufficient period of time. See also section XXI.

d. Paroxysmal tachycardia. See also section XXI.

e. Heart block.

f. Any serious disturbance of rhythm such as auricular fibrillation.

g. Valvular disease.

h. Congenital heart disease.

i. Persistent blood pressure at rest above 150 mm. systolic or above 90 diastolic, unless in the opinion of the medical examiner the increased blood pressure is due to psychic reaction and not secondary to renal or other systemic disease.

j. Thrombophlebitis of one or more extremities if there is a persistence of the thrombus or any evidence of circulatory obstruction in the involved vein or veins.

k. Other abnormalities of the peripheral vascular system, including large varicose veins, Raynaud's disease, Buerger's disease (thromboangiitis obliterans), erythromelalgia and arteriosclerosis. In doubtful cases special tests should be employed.

l. Aneurysm of any vessel.

m. Pericarditis.

n. Acute endocarditis.

o. True angina pectoris.

p. Coronary thrombosis.

q. Neurocirculatory asthenia (effort syndrome), unless very mild. Usual symptoms of this condition are exhaustion, breathlessness, heartache and palpitation. These symptoms may fol-

low exertion such as would not produce them in healthy individuals. These and other symptoms, such as dizziness or fainting, may arise without evidence of organic disease sufficient to account for the disability of the individual. Cases of effort syndrome may be divided into four groups. (In some cases more than one of these factors is present.)

(1) As an accompaniment of organic heart disease.

(2) Following infections.

(3) In individuals with poor physique or insufficient training for the work required.

(4) Orthostatic hypotension or tachycardia.—The blood pressure and pulse rate will be taken with the individual in the recumbent position and after standing three minutes. An increase in a normal recumbent pulse rate to 120 beats per minute or more when the individual stands or a decrease of a normal blood pressure (when the individual is recumbent) to values less than 90 systolic and 60 diastolic when the individual stands may be considered evidence of a definite physiologic disturbance and in itself cause for rejection unless the condition is very temporary following an illness, operation, or exhausted state.

65. Electrocardiogram.—The electrocardiogram is of great assistance in determining the nature of certain cardiac abnormalities, the most important of which are the various arrhythmias, defects in conduction and diseases of the coronary arteries. The electrocardiograph may be utilized in cases where such diagnostic aid is especially indicated but will not be employed as a routine measure.

66. X-ray.—In doubtful cases, fluoroscopy and teleoroentgenography is advised to determine the size and shape of heart and great vessels. Films taken for the study of the lungs will also be viewed for cardiovascular defects.

In MR 1-9 it is advised that any important murmurs are cause for rejection, but no attempt is made therein to define what are important and what unimportant murmurs; the reader is simply referred to the current literature, such as the American and New York Heart Association's publication entitled "Nomenclature and Criteria for Diagnosis of Diseases of the Heart." However, a fair degree of unanimity was exercised in the five cities, although borderline cases were an occasional cause of concern; whether in time all murmurs can be perfectly evaluated remains a problem for the future. In general, it was agreed that very slight or even slight systolic murmurs [5] at the cardiac apex in the absence of cardiac enlargement or of a clear rheumatic history, especially if they were late in time or dissipated or almost cleared by changes in body position or by forced respiration, should be regarded as unimportant and not disqualifying for military service. Very slight systolic murmurs at the aortic valve area and at the left of the lower sternum were also acceptable in the absence of any evidence of heart disease. Pulmonary systolic murmurs, which are present in many normal persons in the recumbent position, were rarely a cause for rejection per se; only if they were loud and but little affected by respiration were they regarded as evidence of an organic lesion. All diastolic murmurs were cause for rejection, but in occasional cases superficial scratchy to and fro sounds, not indicative of cardiac or pericardial disease, were recognized as entirely unimportant.

The heart rate acceptable for the Army is listed in MR 1-9 as below 100 and above 50, but as a rule rates of 100, and rarely of 110, were passed in this reexamination as normal if manifestly of nervous origin. Also, in the absence of evidence of heart block, rates in the forties were also considered normal.

The blood pressure levels of 150 systolic and 90 diastolic were accepted as the maximal readings for 1A classification except in rare cases when a slightly higher systolic reading (160) was attributed to nervousness.

Electrocardiograms were considered normal when there was no prolongation of PR interval or QRS waves beyond the generally recognized upper limits of 0.2 and 0.1 second respectively, when there was no high degree of right or left axis deviation, when there was no flattening or inversion of the T waves in lead 1 or lead 4F and when there was no arrhythmia other than the occurrence of occasional premature beats. Lesser degrees of axis deviation (up to about —10 degrees left and +100 degrees right), prominent S waves in any or all leads, somewhat elevated ST segments (up to 1 mm. in the limb leads or 2 mm. in lead 4F) and slightly inverted T waves in lead 2 corrected by recumbency were acceptable if nothing otherwise was found wrong with the heart.

X-ray (teleoroentgenographic) heart shadows were accepted as normal if their transverse diameters did not exceed by more than 1 cm. the expected measurements according to the individual's height, weight and age as calculated by the Hodges-Eyster tables (quickly determined by nomogram or slide rule).[6] This measurement was considered just as suitable as that of the area and much more easily made. However, the fact that these standards are by no means infallible and that they do not fit all body builds was duly recognized and allowances were made accordingly, as will be noted later. The shape of the heart shadow and the contour of the great vessels were also carefully scrutinized.

5. *Borderline Cases* (table 4).—At this point it is appropriate to discuss the disposition of the many borderline cases that were encountered in each city. In the great majority of cases the criteria as outlined in Mobilization Regulations 1-9 were followed to the letter to avoid misunderstandings, even though a certain amount of leeway is allowed by those regulations according to the discretion of the examiners. But a few cases were accepted with doubtful findings: In Chicago 2 men with an increase in heart size were labeled 1A; in New York there were 8 men with systolic blood pressures slightly above 150 mm. but with diastolic pressures not over 90 mm. and 6 men with heart rates between 100 and 120 who were considered perfectly normal and so graded 1A; in Philadelphia 36 men were passed as normal after careful study of the x-ray films by a roentgenologist, although the transverse diameters of their heart shadows were slightly above the Hodges-Eyster upper limit, as agreed on; and in San Francisco 31 cases of hypertension ("nervous") and 19 cases of tachycardia ("nervous") were accepted as 1A. In Boston all borderline cases were lumped together for convenience of follow-up and, although considered as probably normal, and at first labeled "1 A liberal," were finally rejected for immediate service because of possible confusion, since they did not fit strictly the criteria as at present listed under

5. In Boston it was found convenient to use Levine's classification of loudness of murmurs: 1, very slight; 2, slight; 3, moderate; 4, loud; 5, very loud (and 6, with murmur audible without applying stethoscope to the chest wall) (Freeman, A. R., and Levine, S. A.: The Clinical Significance of the Systolic Murmur: A Study of 1,000 Consecutive Noncardiac Cases, Ann. Int. Med. **6**: 1371 [May] 1933. Levine, S. A.: The Systolic Murmur, J. A. M. A. **101**: 436 [Aug. 5] 1933). A satisfactory agreement was quite quickly reached by the examiners in Boston as to the grade of intensity of a murmur after a little practice; a loudness of grade 1, and up to and including grade 2 minus was acceptable in the case of the apical systolic murmur.

6. Hodges, F. J. and Eyster, J. A. E.: Estimation of Transverse Cardiac Diameter in Man, Arch. Int. Med. **37**: 707 (May) 1926.

MR 1-9. Undoubtedly the large number in this Boston borderline group (114 in all) included grades and types of signs that sometimes were considered within the normal range and sometimes were regarded as a cause for rejection in the other cities. The distinction certainly in many cases was a very fine one.

It is this group of borderline cases rather than those 1A cases that are obviously normal and those 4F cases that are obviously abnormal that will probably prove to be the most important for follow-up to help in deciding whether the present criteria are proper or should be changed, more particularly toward a more liberal interpretation. As yet we have no sound basis for our decisions and each case must be decided on its own merits, from all points of view. Perhaps this will always be so.

6. *The Results of the Reexamination.*—For details of the reexamination the reader is referred to tables 1 to 9, but the more important findings deserve special comment.

(To be continued)

THE PSYCHOSOMATIC MANIFESTATIONS OF FILARIASIS

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AND
LIEUTENANT COMMANDER R. HARWOOD FOGEL (MC), U.S.N.R.

Prosecution of the war in tropical climates has not only stimulated interest in parasitology and tropical medicine but also, coincidentally, ramified the field of psychosomatic medicine. Diseases which only a few years ago were labeled "rare and exotic" are beginning to rival the more familiar illnesses for preferential medical consideration.

Many observers have noticed the mood disturbance associated with the acute phases of tropical parasitic infestation. Particularly is this true of filariasis. As with all systemic infections, there are fatigue, irritability, mild depression and anxiety. However, in addition there is a pervading element of apprehension and concern in the case of white troops which is absent in the infested native population. The cause of this is obvious on inquiry into the setting and circumstances in which this disease has occurred in the members of the armed forces.

The great majority of troops stationed in the South Pacific islands are young unmarried men. This military duty in the tropics has been for most of them a first experience away from their immediate home surroundings. For the vast majority this is the first time they have been outside the continental United States. Therefore it is natural that the circumstances, since they are conducive to pronounced feelings of insecurity, constitute a maximal test of their adaptability.

The life soldiers lead in the tropical jungles of the Pacific Islands predisposes them to the disruption of the feeling of affiliation which is essential for their personal and social security. The omnipresent threat of attack is an added disturbance, and the contrast between the primitive setting and the terrifying technics of warfare is all the more disturbing. This is the background on which is elaborated the psychologic factors of the various tropical diseases to which they are susceptible. They have been prepared for some of these anxiety laden situations by their military training and indoctrination courses as well as by the reassurance and support afforded by a strong group morale. Then too, new and vastly different experiences have the effect of absorbing tension and of expending anxiety by their novelty and intrigue. Moving pictures, mail, familiar recreational activities and newly formed friendships help to dilute a nostalgia which is natural and which must be considered appropriate. An individual's ultimate adjustment is the blend of these conducive and disrupting forces coloring his previous personality pattern.

There have been no clearer proofs of the validity of the psychosomatic concept than those observations which have been made on the nature and quality of adjustment in these carefully selected, physically perfect, young adults. The evidence for the contention that environmental agents are prepotent forces in the production of a reaction type is also striking. In substantiation of this, the following are the observations which have been made on the psychosomatic manifestations of a typical exotic disease—filariasis.

It has been widely appreciated in this war that with operations being conducted in African, Asiatic and Pacific theaters the problems incident to cultural and environmental contacts would play an important role. Fuller information concerning the peoples, customs and indigenous diseases of these areas is now generally appreciated more than ever before. Despite this, there are still many strange beliefs concerning them and their possible effect on the troops on duty with or near them. Bugaboos and superstitions still distort the thinking of many, exaggerating their fears and perverting their judgments. Particularly is this true of the beliefs concerning tropical disease and the responsibility of the native population for their dissemination. Not only is the public perplexed, but also, much too frequently, the medical profession is uninformed about their cause, nature, complications and sequelae. The result is that emotional symptoms are associated with these diseases and are little understood. The status of military operations in the South Pacific theater is such that the threat of widespread tropical disease is now being restrained by adequate sanitary and prophylactic measures of mosquito control. The psychologic overemphasis which is given to the sequelae of tropical disease can be minimized in a similar manner by equally intensive education of all troops on duty in endemic areas. Fortified by authentic information, infested individuals will be better able to cope with the problems which arise from the need to explain their disease.

Bancroftian filariasis caused by Wuchereria bancrofti is the most common and the most widely distributed of the six forms of filariasis. The parasite is endemic along the Mediterranean coast of Spain, on the northeast coastal areas of Australia and in parts of Argentina. The parasite is hyperendemic in South China, Indo-China, the Dutch Indies and Polynesia, especially in the Samoan group, the Fiji and the Wallis Islands. The prevalence of the disease in the latter areas is rivaled only by that found in central Africa. Throughout Central America, the Greater and Lesser Antilles and the northeastern section of South America, bancroftian filariasis is also common.

The adult filariae usually inhabit the lymphatic vessels and glands and discharge great numbers of actively

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motile embryos or microfilariae into the lymphatics, from which they pass into the circulating blood. The microfilariae produced by Wuchereria bancrofti in the South Pacific islands do not occur with the nocturnal periodicity characteristic of the form present in Africa, India and the Western Hemisphere. Occasionally one can find the microfilariae in the peripheral blood by examining it with the thick smear technic. Of a large group of Samoan natives examined, only 13.6 per cent had microfilariae demonstrable in ordinary thick blood films,[1] and in none of the several hundreds of relatively acute cases occurring in the white troops seen by us were the microfilariae demonstrated. In this regard it is to be noted that these men were exposed while on duty in these areas for periods ranging from four months to two years before the development of clinical symptoms.

Mosquitoes serve as the intermediate host, and two species are predominantly responsible for the transmission. Aedes scutellaris, a dim light biting mosquito, is the principal vector, with Culex fatigans, a night feeder, of secondary importance.

The symptoms of the disease divide themselves into two stages. The early stage is characterized by a recurrent lymphangitis and lymphadenitis with the usual associated systemic symptoms. Unilateral scrotal lesions, consisting of funiculitis, epididymoorchitis and edema of the scrotal skin, are the most common in occurrence. Unilateral upper extremity and bilateral scrotal involvement are second and third, respectively, in frequency of anatomic distribution. It has been the clinical urologic experience of one of us (R. H. F.) that 70 per cent of the cases in the male show some degree of genital pathologic change, even though superficially it is not apparent during the early course of the disease.

The later stage is characterized by the development of a varying degree of elephantiasis. The disappearance of the acute, recurring lymphangitis which usually follows rest does not occur so readily, and a reparative fibrosis slowly occludes lymph channels and is therefore responsible for the edema distal to the obstruction. The scrotum, lower extremities and, less frequently, the upper extremities, in that order, are the seats of predilection for its development. The deformity is proportional to the extent of mechanical obstruction of the lymphatics, and the adult filariae may be found in the lymph nodes during both stages and often undergo calcification, obstructing, to an even greater degree, the lymph drainage from the affected part.

Early the manifestations of an emotional overlay are seen in practically all patients infested. But, even more than most patients with similarly incapacitating illnesses, these persons are subjected to a psychologic assault of no small proportions. The involvement of their genitalia in the process personalizes, to a considerable degree, latent insecurities. Deformity, impotence, sterility and ostracism are a sufficiently foreboding quadrad to distort seriously the quality of the patient's present and future psychosocial adjustment. This is made the more real to them because they have had frequent opportunities to see the advanced stages of deforming elephantiasis in the native population.

One of the striking features about the natives of all the South Pacific islands, particularly the Samoan, Tongan and Wallis group, is the prevalence of mumu (Samoan for filariasis). As many as 85 per cent of some villages are visibly crippled. Accordingly, it is to be expected, particularly of young adults, that their initial reactions of curiosity and amazement are followed by revulsion and disgust, since the disfigurement is striking. Curiosity, which invariably leads to further inquiry, soon discovers the presence of numerous examples of adult males whose external genitalia are as large as coconuts, watermelons and, occasionally, beer kegs. Jesting and semilewd remarks, which commonly follow lay contact with genitourinary disease, serve in a measure to intensify deep seated anxieties about disease. With this as an ever present example, it is not to be unexpected that the onset of the same disease in the white troops precipitates feelings of depression, apprehension and dread. Humor, which is almost universally incited by any group discussion of the subject, reverberates with grisly overtones, and a great number of the relatively uninformed develop moods of hopeless helplessness when they visualize what they fear will be their future.

It follows then, in the natural progression of the illness, that attention and concern are genitally focalized by pain, swelling, medical manipulation and attention directed questioning by examining physicians. Since thoughts of returning home are foremost in the minds of all military personnel on foreign duty, concern about the residua and sequelae is a prominent finding, particularly since it is common knowledge that their illness is officially recognized to be sufficiently incapacitating to warrant medical survey from the area. Depression and reluctant anticipation of home coming ensue at this point, for it is then that the question of the effect of this disease on subsequent domestic adjustment is almost automatically raised. There are many corollaries of this. Many patients, particularly the more sensitive, imaginative ones, conjure up difficulties connected with dress, frequently anticipating insuperable difficulties in being able to observe the usual conventional amenities required by civilized modesty. The question of explaining their incapacity arises, and it is anticipated by some that they will be tainted with the stigma of venery because they have evident genital disease.

The letters written by these patients, attempting to explain their hospitalization, are pathetically revelatory. Statements which say, in effect, "I have acquired a disease which is common out here and I'm afraid it is going to upset our plans for marriage" are typical of a number of cryptically uninformative decisions which create considerable anguish in fiancées and relatives as well as serve further to estrange and demoralize an already isolated and distressed individual. A common psychologic symptom is the resolution not to return home after discharge for fear of questioning, the need for explanation and the anticipated inability to adjust adequately in the marital situation. Tangentially there is another course often taken: the decision to make no mention of the illness but to experiment sexually to determine their capacity to perform satisfactorily. This, in most instances, is an unfortunate decision because, prompted by desperation, it is predestined to incur anxiety. Impotence often follows as a consequence of concern over the outcome of a test already heavily taxed by tension. With the dreaded result at this point a *fait accompli,* the usual mechanisms seen in entrenching neuroses operate. Symptom fixation is accelerated by

1. Dickson, J. G.; Huntington, R. W., and Eichold, Samuel: Filariasis in Defense Force, Samoan Group, U. S. Nav. M. Bull. **61**: 1240-1251 (Sept.) 1943.

the reinforcing of this traumatic experience by earlier psychosexual traumas. Of these, masturbatory guilt is prominent. The usual alternatives taken by the psychopathologic condition are those offered by a reactive depression with neurasthenic features and an anxiety neurosis with compulsive-obsessive phenomena.

The premorbid personality type is basically responsible for the neurotic pattern characteristic of later stages. It is interesting to note in this regard that the persistence of symptoms, both psychic and somatic, is not necessarily related to demonstrable pathologic changes. Total and partial impotence may persist for many months after a complete symptomatic remission. Loss of libido, with or without loss of potentia, often occurs as an isolated symptom.

The group grossly classified as reactive depression types are milder versions of the usual reactive depression. There is the typical personality contraction with guilt, depression, retardation and—almost constantly appearing features suggestive of neurasthenia—fatigability, organ preoccupation, hypersensitivity, work incapacity and worry.

On the other hand, another large group is composed of those patients who show predominating anxiety symptoms with related compulsive features. They, as a group, have not been as successful in completely channelizing their anxiety. Early sexual conflicts are intimately blended with their present complaints. Anxiety is sometimes precluded by resorting to compulsive sexual experimentation which is rarely gratifying. There seems to be a more concentrated psychosexual focalization of symptoms in this group than in the former. As a rule, they lack the diffusion of anxiety quality which manifests itself as weakness, backache, leg pains and anorexia.

In both categories the initial complex is often obscured by an accretion of secondary symptoms. These are often misleading, since the referents are purposefully vague. Irritability, at times frank belligerance, universal dissatisfaction and what is best described as "gold bricking" constitute the presenting symptom picture. The "face saving" protection offered by these complaints is a transparent mechanism.

Psychotherapy, after the development of frank psychologic symptoms, is difficult. There is then an almost unshakable reluctance to accept the formulation that impotence and lack of libido are psychogenic in their origin; particularly is this so when the patient's beliefs have been supported by his own uncritical observations and sometimes the instructions of uninformed physicians. The uncertain prognosis is an additional factor, it being fairly common knowledge that, to date, there is no satisfactory treatment. Credence in the usually held theory that removal to a cool climate accomplishes effective therapy often is shaken by personal familiarity with recrudescence of symptoms after return to the United States. There is a tendency for patients to overemphasize the significance of these relapses. The type of communal living to which military personnel are subjected is conducive to the sharing of confidences with companions similarly afflicted, and the adverse effects of suggestion increase the individual's susceptibility to symptoms.

The quality of "contagion" plays a large role in the dissemination of symptoms which lead to incapacity. Injudicious questions by well intentioned physicians frequently induce the phenomenon to which Hurst has given the name "iatrogenic hysteria." Fear of ridicule and embarrassment dooms each successive attempt to failure and sets the stage for a firmly established neurosis.

In a large percentage of cases their antecedent instability requires no great threat to precipitate the symptom complex described. In retrospective analysis sexual performance appears to have assumed disproportionate significance in a sufficient number of these patients to warrant it being assumed to be the latent source of the future psychopathologic condition. This overevaluation appears more or less constantly in the majority of cases and therefore must be considered to have positive etiologic value.

In general, if psychotherapy is conducted on a group basis, coupled with the usual individual interviews, there is a greater likelihood of relieving symptoms in a higher percentage. Because of the tendency for present traumatic experiences to merge with earlier conflicts, it is advantageous to avoid as far as it is possible a too penetrating analysis of background factors. This, for the most part, unnecessarily protracts therapy and is notoriously unproductive of satisfactory results.

COMMENT

The value of prophylactic psychiatry in raising the threshold of vulnerability to psychologic disorders cannot be overestimated. The psychologic stability of soldiers is directly proportional to their factual knowledge of the situations in which they will serve. For the average individual the ravages of disease and war are exaggerated. Information of this sort is rarely limited to specific individuals. Since the hazard is a common one, it has the property of diffusion and the awareness of it rapidly becomes universal. It has been amply demonstrated that psychologic inoculation is the only effective preventive. Latent and imaginary dangers are naturally shocking on initial recognition, and attendant anxiety can be dispelled only when men are given an understanding of the irrationality and emptiness of most of their fears. A patient, simple, repeated presentation of facts will in most instances assuage doubts and "debunk" groundless anticipations.

The medical officer is in an ideal position to render this valuable service. He is known to the men, he has had the opportunity to demonstrate his technical competence and he is serving with them, sharing their hardships and experiences. In addition to group talks, individual discussions of particular problems with men who have contracted the disease will in a large degree obviate their "flight into nonorganic symptoms."

Group discussions on the role of the mosquito in the transmission of the disease establish a reasonable explanation for the directives on screening and mosquito control. Rules and regulations are appreciated as personally valuable, prophylactic directions, not as arbitrary commands. Simple, nontechnical explanations of the pathology, supplemented by illustrative charts and blackboard diagrams, can do much to allay fears of impotence, sterility or possible genital transmission. Sex hygiene talks on the causes of impotence will obviate the many false conclusions so often drawn. Furnished with authoritative information, the soldier is less likely to assume that the familiar picture of the chronically infested native with elephantiasis is a mirror prediction.

PULMONARY EDEMA

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RAHWAY, N. J.

The vast increase in our industrial production since the outbreak of war has of necessity exposed a greatly increased number of workers, many of them inexperienced in the handling of industrial equipment, to hazards from toxic fumes. This unfortunate effect has been particularly reflected in the rise in incidence of pulmonary edema following exposure to toxic gases. Indeed, so frequently has pulmonary edema been noted as a terminal event in these cases that it seems desirable to call attention to a simple method which has proved effective in the prevention as well as the treatment of these cases.

Briefly, the method consists in absolute bed rest and the immediate administration of oxygen under atmospheric pressure with a provision for expiration against calibrated resistance of from 1 to 6 cm. of water pressure.

We begin at once the administration of 100 per cent oxygen under atmospheric pressure, setting the expiratory valve or the efferent tube leading into the water bottle so as to afford 1 cm. of water pressure. This pressure is gradually, though fairly rapidly (five to ten minutes), raised to not more than 6 cm. of water pressure. Oxygen administration under these conditions is continued for from one to three hours, depending on the appearance and state of the patient. Trial periods are made of breathing without the mask for five to fifteen minutes, and if any increase in respiratory rate, difficulty in breathing, cyanosis or coughing is observed the mask is reapplied and oxygen continued under the same conditions for a further period. With prompt and effective administration of oxygen in this way we have not had a single fatality from pulmonary edema in the past nine years.

In some instances considerable time may elapse between the patient's exposure and his delivery to the medical department. In most of these cases in which actual pulmonary edema is present we follow the recommendations Dr. D. W. Richards Jr.[1] made some time ago for the administration of 1 to 100 solution of epinephrine by the oral nebulizer method either prior to or during the administration of oxygen. This has proved to be a valuable adjunct in these advanced cases as well as in cases in which the irritant itself has produced bronchiolar spasm obstructing the intake of oxygen. (In these cases oxygen may be administered under 2 or 3 cm. of water pressure during inspiration, with the usual positive pressure used during expiration.)

The administration of the 1 to 100 epinephrine solution may be repeated at intervals or may be done continuously by applying the nebulizer to a side arm of the oxygen intake tube.

Without significant bronchiolar obstruction and before advanced pulmonary edema has appeared, inspiration of oxygen under atmospheric pressure with expiration against a calibrated resistance of 6 cm. of water pressure has handled successfully all cases we have encountered.

While in general our approach, as well as the actual management of most of our cases, has been that of prevention, we are convinced from our own experience that the use of the 1 to 100 epinephrine solution combined with the administration of oxygen under positive pressure of 1 to 6 cm. of water may be recommended for active treatment of the advanced stages of pulmonary edema caused by certain noxious gases. In our experience this has been a far more effective method of handling frank pulmonary edema than any of the procedures hitherto suggested. We find that on check of our records for the past year and a half, we have had 316 cases in which only this method of treatment has been employed. Case reports, as well as an analysis of our data for the ten year period during which this method of treatment has been employed, will be published later. If one assumes that no more than 50 per cent of these were of a severity likely to result in advanced pulmonary edema, our experience in completely preventing the latter seems appreciable.

Through educational means directed in behalf of the prevention of pulmonary edema, we have secured the cooperation of all employees in coming to the Medical Department immediately after undergoing exposure to one of these noxious agents which are, in the main, oxides of nitrogen, phosphorus oxychloride, phosphorus pentachloride, phosphorus trichloride, methyl bromide, chlorine, cadmium, and dust from certain alkaloids. Thus we see the cases in all but very few instances at the beginning of the so-called "quiescent" or "latent" period.

We do not use and, as a matter of fact, advise against the use of oxygen-carbon dioxide mixtures.

In some few cases we have found the oxygen-helium mixture of significant benefit.

While tanks of 100 per cent oxygen are routine, we use a special mixing valve which will allow for admixture of air in the tube leading to the face mask. However, air should not be added in excess of 25 per cent since the patient will cough in the face mask if at least a 75 per cent oxygen concentration is not maintained.

One or two swallows of milk seem to be the most nearly satisfactory means of controlling the chronic hacking cough which so frequently occurs after the oxygen pressure treatment of cases exposed to irritant gases, particularly phosphorus oxychloride.

We have learned from experience that it is a great mistake to allow for a delay in beginning this treatment, which should be started as early as possible after exposure. If one waits for anoxic anoxia and until the patient is actually drowning in his own fluids, or the chest, by x-ray, shows a veritable "snow storm," then treatment has been unwisely delayed. However, even at this stage, oxygen and positive pressure are life-saving, and morphine, venesection, mercurial diuretics, or other such ill-advised or heroic measures are, in my opinion, contraindicated and should be used only as control measures in experimental studies.

While the oxides of nitrogen are by no means the most toxic of irritant gases, they represent in many industries the most common cause of pulmonary edema. Unfortunately, this ominous reaction is frequently most insidious in its onset. For this reason every physician in industries in which this hazard exists should be on the alert for its early detection and take advantage of every means at his disposal to see that proper treatment is instituted as early as possible after exposure.

All cases which have been exposed to such irritant gases should be subjected to oxygen therapy with the apparatus so arranged that exhalation is carried out

1. Richards, Dickinson W., Jr.; Barach, Alvan L., and Cromwell, Henry A.: Use of Vaporized Bronchodilator Solutions in Asthma and Emphysema: A Continuous Inhalation Method for Severe Asthmatic States, Am. J. M. Sc. **199**: 225 (Feb.) 1940.

against a calibrated resistance. This form of therapy conducted in the incipient stages of pulmonary edema will frequently prevent its advancement and will be effective in saving many more lives than will more heroic measures instituted when the condition has reached its more advanced stages.

EFFECT OF CERTAIN SULFONAMIDES ON THE ELECTRICAL ACTIVITY OF THE CEREBRAL CORTEX

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AND
SIDNEY COHEN, M.D.
WITH THE TECHNICAL ASSISTANCE OF MARGUERITE M. LYONS, A.B.
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The local application of sulfonamides to cranial injuries has become a widespread practice, particularly in military surgery. Recently reports by Watt and Alexander [1] in England and Pilcher and his co-workers [2] in this country have indicated that sulfathiazole in particular should not be allowed to come in contact with the cerebral cortex because of the danger of generalized convulsions. Sulfadiazine and sulfapyridine did not appear to possess this disadvantage. Because of the considerable practical importance of the problem at present, we have undertaken a series of experiments designed to determine the effect of local applications of various sulfonamides on the electrical activity of the cortex.

METHOD

The experiments were all acute ones and were done on cats under light or moderate anesthesia induced with pentobarbital sodium. The electrical activity of the exposed cortex was recorded by a Grass ink-writing electroencephalograph such as is used for clinical electroencephalography. Unipolar electrodes were used. The stigmatic electrodes consisted of cotton wicks moistened with isotonic solution of sodium chloride and wound about chlorided silver wires with the free ends lightly touching the cortex. The cat's ears were grounded and served as the indifferent electrodes.

The drugs tested were sulfanilamide, sulfathiazole, sulfadiazine and sulfapyridine. Two preparations of each drug were used, the acid, a relatively insoluble sulfonamide compound, and the sodium salt of the compound. The relevant physical and chemical properties of the eight preparations are given in the accompanying table.

Experiments were done on 23 cats. Sodium sulfanilamide was tested eight times, sodium sulfathiazole sixteen times, sodium sulfadiazine twelve times and sodium sulfapyridine eleven times.[3] Sulfanilamide was tested five times, sulfathiazole eight times, sulfadiazine seven times and sulfapyridine twice.

Experiments were conducted with both soluble and insoluble preparations. The soluble preparations were applied to the cortex by moistening a small cotton pledget in a solution of the drug of the appropriate strength made with an isotonic solution of sodium chloride and placing it on the cortex for ten minutes. At the end of that time the pledget was removed, the cortex was washed with warm saline solution, the cotton wick electrode was reapplied and recording was resumed. The insoluble preparations were simply dusted on an area of the cortex, and the wick electrode was then brought into contact with it. The powder was left on for a longer or a shorter time (thirty to one hundred and twenty minutes).

The soluble preparations form rather alkaline solutions, as shown in the table, and it was necessary to control for this factor. Solutions of sodium hydroxide of p_H 10.3 were applied to the cortex for ten minute periods without any change in the electrical activity.

RESULTS

We found that solutions of the sodium salts of sulfapyridine and sulfathiazole of 1.25 to 2.5 per cent or more when applied locally for ten minutes produced striking electrical changes. Solutions of sodium sulfadiazine produced similar changes when applied in slightly higher concentration—about 5 per cent or more. The electrical responses consisted in high voltage negative or diphasic spikes, appearing at irregular intervals. The spikes were similar to those seen after local application of strychnine to the cortex and are illustrated in figure 1. Solutions of sodium sulfanilamide varying in concentration from 2.5 to 20.0 per cent were applied to the cortex in the same way without producing any significant change in the electrical activity.

There were two characteristics of the response to solutions of sodium sulfathiazole which seem worth noting: the latent interval between the removal of the pledget and the first appearance of the characteristic spikes, and the relatively long duration of the response. In only two of nine trials was the characteristic response to sodium sulfathiazole present at the time the drug was removed from the cortex. In the other seven trials the response did not appear till five to fifteen minutes later. The average latent period for the nine trials was eight minutes. With sodium sulfapyridine and sodium sulfadiazine, on the other hand, the electrical response either was present immediately on the removal of the drug or else did not appear at all. The average duration of the response (either from the time of the removal of the drug from the cortex or from the time of the first appearance of the response) was thirty-four minutes for sodium sulfathiazole (range fourteen to fifty-one minutes), eleven minutes for sodium sulfapyridine (range four to fourteen minutes) and only seven minutes for sodium sulfadiazine (range three to fifteen minutes).

The following results were obtained by the application of the acid, relatively insoluble forms of the four drugs to the cortex. The application of sulfathiazole powder produced the same electrical response as did the soluble salt. In an experiment in which the powder was applied to the anterior sigmoid gyrus (motor area) the opposite foreleg twitched synchronously with each spike in the electrical record for twenty minutes; i. e., the cat had a mild focal seizure despite its anesthesia (fig. 2). The application of sulfapyridine powder was followed by the appearance of high voltage, four to seven a second waves in the electrical record (fig. 2). We found no change in electrical activity following the application of either sulfadiazine or sulfanilamide.

COMMENT

Direct application of sulfathiazole or of a solution of the sodium salts of sulfathiazole, of sulfapyridine or of sulfadiazine to the cat's cortex gives rise to spontaneous electrical activity in the cortex which appears as high voltage spike discharges in the electroencephalographic record (figs. 1 and 2). These spike discharges are evidence of an irritant action of these drugs on

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This work was aided by a grant from the John and Mary R. Markle Foundation.

From the Department of Neurology, Harvard Medical School, and the Neurological Unit, Boston City Hospital.

1. Watt, A. C., and Alexander, G. L.: Epilepsy Following Application of Sulfathiaziole Near Brain, Lancet **1**: 493-495 (April 25) 1942.
2. Pilcher, Cobb; Angelucci, Ralph, and Meacham, W. F.: Convulsions Produced by Intracranial Implantation of Sulfathiazole: Preliminary Report, J. A. M. A. **119**: 927 (July 18) 1942.
3. Sodium sulfanilamide, the only one of these compounds which is not commercially available, was furnished by Dr. K. K. Chen of Eli Lilly and Company. Dr. Chen also furnished the figures on the p_H of this compound.

the cortex. In fact we feel that they are the electrical manifestation of a convulsive state of the cortex, as shown by the focal seizure following the application of sulfathiazole in one animal (fig. 2) in which each spike was synchronous with a convulsive twitch of the opposite forelimb. This view is supported by the known convulsant action of sulfathiazole,[4] by the similarity of the spike discharge to that produced by local application of strychnine to the cortex (fig. 1) and by its similarity to the myoclonic spike discharge seen in epileptic human beings [5] and in monkeys during seizures induced by electrical stimulation of the cortex.[6]

The application of sulfapyridine to the cortex produced an increase in the electrical activity which is interpreted as evidence of an irritant effect of a lesser degree (fig. 2).

The local application of sulfadiazine to the cortex produced no change in the electrical activity although, as noted in a foregoing paragraph, the application of a 5 per cent solution of its sodium salt caused the prompt appearance of spike discharges. It is suggested that the differences between the irritant effects of sulfapyridine and sulfadiazine and those of their sodium salts may be largely dependent on their relative solubilities, as shown in the table. Sulfathiazole, which is more soluble than either of the two, had the same irritant effect on the electrical activity of the cortex as did the solutions of its sodium salt, although the effect took longer to become evident. Sulfadiazine, which is only one eighth as soluble as sulfathiazole, gave no evidence of irritant effect on the electrical activity of the cortex despite the fact that solutions of its sodium salt had such an effect in nearly as low concentrations as sodium sulfathiazole. Sulfapyridine, which is intermediate in solubility between the other two, had some irritant effect on the electrical activity, but this was less pronounced than that of sulfathiazole, though sodium salts of the two compounds were effective in about the same concentration.

Relevant Physical and Chemical Properties of Sulfonamide Compounds and Sodium Salts Used in Experiments

Drug	Solubility, Gm. per 100 Cc. in Water at 37.5 C.*	p_H of 10 per Cent Solution at 37.5 C.†
Sulfanilamide	1.5	
Sulfathiazole	0.094	
Sulfapyridine	0.050	
Sulfadiazine	0.012	
Sodium sulfanilamide	20.0	11.6
Sodium sulfathiazole	60.0	10.0
Sodium sulfapyridine	80.0	10.7
Sodium sulfadiazine	65.0	10.2

* The figures are from W. G. Clark, E. A. Strakosch and N. I. Levitan (Solubility and p_H Data of Some of Commonly Used Sulfonamides, J. Lab. & Clin. Med. **28**: 188-189, 1942) and W. H. Feinstone, R. D. Williams, R. T. Wolff, E. Huntington and M. L. Crossley (Toxicity and Chemotherapeutic Activity of 2-Sulfanilamide Pyrimidine [Sulfadiazine], Bull. Johns Hopkins Hosp. **67**: 427-456, 1940).

† These figures are from Chen,[3] R. C. Ellingson (Sulfapyrazine, Sulfapyrimidine and Sulfadiazine, J. Am. Chem. Soc. **63**: 2524-2525, 1941), and Feinstone and his co-workers just cited.

In the case of sulfanilamide the situation is different. Neither the drug itself nor solutions of its sodium salt up to concentrations of 20 per cent showed any evidence of irritant effect on the electrical activity of the cortex. From this point of view therefore sulfanilamide appears to be the drug of choice for local application where there is a possibility of contact with the cerebral cortex.

4. Watt and Alexander.[1] Pilcher, Angelucci and Meacham.[2]
5. Gibbs, F. A., and Gibbs, E. L.: Atlas of Electroencephalography, Cambridge, Mass., Lew A. Cummings Company, 1941, p. 221.
6. Rosenblueth, A., and Cannon, W. B.: Cortical Responses to Electric Stimulation, Am. J. Physiol. **135**: 690-741 (Feb.) 1942.

One of the other three drugs tested (sulfathiazole, sulfapyridine and sulfadiazine) might seem preferable to sulfanilamide by reason of being a more efficient bacteriostatic agent or for other analogous reasons. In considering the advisability of using any of the three locally near the cerebral cortex, the results reported here appear to have some significance. From them we conclude that the convulsions reported in human beings following the intracranial implantation of sulfathiazole [1] might possibly occur following the use of sulfapyridine and sulfadiazine also. Since local concentration of the drug seems to be an important factor, the use of relatively insoluble forms would appear to minimize this possible danger.

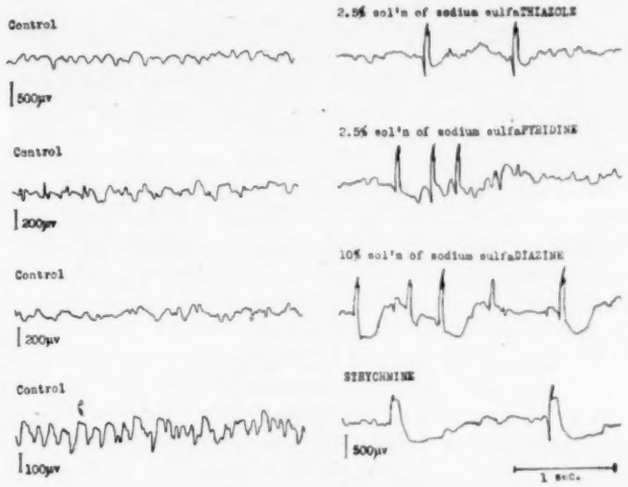

Fig. 1.—The change in electrical activity produced by the local application to the cat cortex of solutions of sodium sulfathiazole, sodium sulfapyridine and sodium sulfadiazine. The response to strychnine is included for comparison.

SUMMARY AND CONCLUSIONS

Neither sulfanilamide nor its sodium salt in concentrations up to 20 per cent had any significant effect on the electrical activity of the cortex of lightly anesthetized cats.

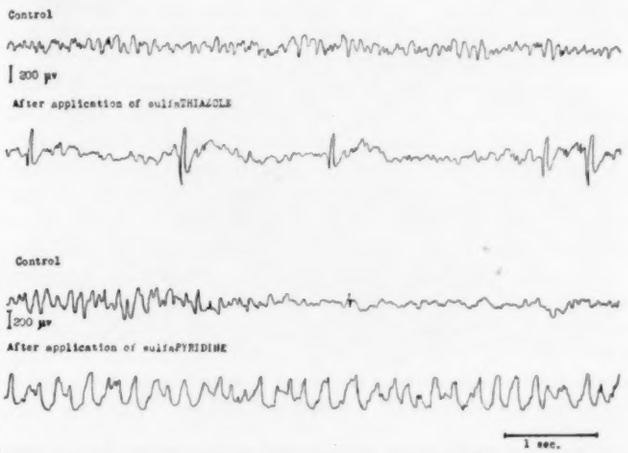

Fig. 2.—The change in electrical activity produced by the local application to the cat cortex of sulfathiazole powder and sulfapyridine powder. In the case of sulfathiazole the animal's foreleg of the opposite side gave a clonic jerk synchronously with each of the high voltage spikes.

Solutions of the sodium salts of sulfathiazole, sulfapyridine or sulfadiazine produced striking changes in the electrical records which are interpreted as evidence that these drugs have a convulsant action on the cerebral cortex of the cat. Sulfathiazole powder produced the same electrical changes and on one occasion was accom-

panied by a focal seizure. Sulfapyridine powder produced increased electrical activity of a less striking kind. Sulfadiazine powder produced no significant change in electrical activity. The solutions of the sodium salts were applied in each instance for ten minutes; the acid powders for periods ranging from thirty minutes to two hours.

It is concluded that as far as irritant or possible convulsant action on the cortex is concerned sulfanilamide is the safest of these four drugs for local intracranial application where there is a possibility of contact with the cerebral cortex.

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THE TALCUM POWDER PROBLEM IN SURGERY AND ITS SOLUTION

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Our purpose in this report is to reemphasize the very serious surgical hazard incident to the use of talc as a dusting powder for rubber gloves and to recommend potassium bitartrate as a substitute powder.

Even a cursory knowledge of the rapidly increasing surgical literature dealing with talc convinces one that this powder creates serious postoperative hazards. After the technic of dry gloves was adopted, practically a quarter of century elapsed before surgeons recognized the evil agency of talc, and even now many are unaware of its harmful potentialities. Equally noteworthy is the fact that, in the various reports devoted to this subject, efforts center almost exclusively on detailed descriptions of the surgical complications due to talc, with practically no stress laid on the possibility of substituting for it some satisfactory, innocuous powder. As a result, at the very moment that this is being written, talcum powder is in almost universal use in preparing gloves aseptically.

As evidence of the pressing need of replacing talcum powder, one has only to call attention to the numerous reports in the literature in which are recorded cases of postoperative intestinal obstructions due to talc. The seriousness of this complication becomes all the more significant when one considers that in these cases of foreign body peritonitis with obstruction the obstruction recurs with menacing frequency, requiring multiple operations. In our survey of the literature we found numerous histories of patients who were subjected to from two to four and even more operations for the relief of successive obstructions. Such cases have been reported by Antopol,[1] Fienberg,[2] Owen,[3] Ramsey and Douglass,[4] McCormick and Ramsey,[5] Byron and Welch,[6] Ramsey[7] and German.[8]

Inevitably there comes to mind all the precautionary surgical procedures and technics that have been recommended during the past two decades as prophylactic measures against postoperative intraperitoneal adhesions; and this in the face of the fact that, all the while we have been seeding the operative field with talcum from the surface of gloves[9] and from accidental glove punctures or tears during operations. Such accidents furnish a fertile source of contamination with talcum, because the fingertip of a carelessly prepared glove often contains as much as 100 mg. of talc. Studies by Weed and Groves[10] show that (*a*) in 74.4 per cent of all operations some gloves are torn and (*b*) 22.6 per cent of all gloves used show rents or punctures. These data were obtained by Weed and Groves through a period of twenty months of operating, using a total number of 35,763 gloves. Some months 32 per cent of the gloves showed rents or punctures. The high incidence of perforation of rubber gloves during operation (22 per cent) was recently emphasized in an editorial in the *British Journal of Surgery*.[11] German[8] found that in a series of 50 patients 40 showed intraperitoneal talc that had been deposited accidentally during a previous laparotomy. German examined his microscopic preparations in polarized light, which renders the talc crystals much more readily visible. We show in figures 1 and 2 the striking difference between talc as demonstrated in an intraperitoneal granuloma viewed by ordinary and by polarized light. In 42 of German's patients (84 per cent) one previous laparotomy, in 7 patients (14 per cent) two previous laparotomies, and in 1 patient (2 per cent) five previous laparotomies had been performed. Of course in such a study the talc may come from the surface of the gloves or through accidental perforations of them, or possibly from gauze sponges or pads contaminated with talcum powder.

The noxious properties of talc are thrown into bolder relief when one learns that it is a trouble maker elsewhere than in the peritoneal cavity. Granulomas resulting from talc implantation have been described in the rectum, vagina, cervix and brain and in healing wounds by Antopol and Robbins,[12] Erb,[13] Antopol,[1] Fienberg,[2] Ramsey and Douglass,[4] Grieco,[14] Cline[15] and others. We have heard, by way of a personal report, of troublesome consequences following the accidental entrance of talcum powder into the conjunctival sacs of operating room nursing personnel. On the basis

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Dr. Kidd was formerly resident in surgery at the Barnard Free Skin and Cancer Hospital.

Dr. Christopher Carruthers, research associate, Barnard Free Skin and Cancer Hospital, made helpful suggestions regarding the chemistry of the various powders used. Dr. Morris Moore, mycologist, extended courtesy and help with the bacteriologic phase of this study. The Mallinckrodt Chemical Works, the Monsanto Chemical Company, the Corn Products Refining Company and the Corn Starch Division of Anheuser-Busch, Inc., gave generous cooperation.

1. Antopol, William: Lycopodium Granuloma, Arch. Path. **16:** 326 (Sept.) 1933.
2. Fienberg, Robert: Talcum Powder Granuloma, Arch. Path. **24:** 36 (July) 1937.
3. Owen, M. A.: Peritoneal Response to Glove Powder Containing Talc, Texas State J. Med. **32:** 482 (Nov.) 1936.
4. Ramsey, Thomas L., and Douglass, Fred M.: Granulomatous Inflammation Produced by Foreign Body Irritants, J. Internat. Coll. Surgeons **3:** 3 (Feb.) 1940.
5. McCormick, E. J., and Ramsey, T. L.: Postoperative Peritoneal Granulomatous Inflammation Caused by Magnesium Silicate, J. A. M. A. **116:** 817 (March 1) 1941.
6. Byron, F. X., and Welch, C. S.: Complication from Use of Glove Powder (Talc Nodules in Surgical Scars), Surgery **10:** 766 (Nov.) 1941.
7. Ramsey, Thomas L.: Magnesium Silicate Granuloma, Am. J. Clin. Path. **12:** 553 (Nov.) 1942.
8. German, William McKee: Dusting Powder Granulomas Following Surgery, Surg., Gynec. & Obst. **76:** 501 (April) 1943.
9. It is by no means a universal practice for surgeons to wash the surface talc off the gloves before beginning to operate. Moreover, this surface talc washes off only with the greatest difficulty and, even then, not completely.
10. Weed, Lyle A., and Groves, Jessie L.: Surgical Gloves and Wound Infections, Surg., Gynec. & Obst. **75:** 661 (Nov.) 1942.
11. Rubber Gloves in Surgery, editorial, Brit. J. Surg. **30:** 283 (Jan.) 1943.
12. Antopol, William, and Robbins, Charles: Lycopodium Granuloma Resulting from Use of Anal Suppositories, J. A. M. A. **109:** 1192 (Oct. 9) 1937.
13. Erb, I. H.: Lycopodium Granuloma, Surg., Gynec. & Obst. **60:** 40 (Jan.) 1935.
14. Grieco, Faust: Granuloma da licopodio e da talco in seguito a laparotomia, Arch. ital. di chir. **42:** 641, 1936.
15. Cline, John W.: Lycopodium Granuloma, an Avoidable Surgical Complication, California & West. Med. **48:** 189 (March) 1938.

of a study of the talcum hazard in the preparation of rubber gloves for sterilization made by the Illinois Division of Industrial Hygiene, Kronenberg [16] suggests it would be wise to institute measures to control and remove talc dust in order to avoid health risk to nurses.

Fig. 1.—Intraperitoneal talc granuloma illuminated by ordinary light. Talc crystals seen with some uncertainty. Magnification 116 diameters.

HISTORICAL SUMMARY

The earliest reported clinical work on intra-abdominal complications arising from powder in the peritoneal cavity had to do not with talc but with lycopodium, which is a dusting powder made from the club mosses, to the spores of which the peritoneum reacts almost exactly as it does to talc. Hippolyte Martin [17] in 1881 and Muscatello [18] were the first to demonstrate experimentally the ill effects of lycopodium powder on the peritoneum. Independently, Carlo Bezzola [19] and von Podwyssozki [20] studied experimentally similar deleterious effects due to intraperitoneal instillation of diatomaceous earth (kieselguhr). In 1913 Lambert [21] showed that even in cell growth in vitro lycopodium spores evoked a foreign body response with outgrowth of connective tissue cells, wandering cells and giant cells. Marchand [22] of Leipzig in 1921 corroborated experimentally the severe irritant qualities of lycopodium powder when injected intraperitoneally in animals. During the past ten years considerable experimental work has been reported emphasizing the irritant qualities of talc when injected intraperitoneally,[23] intrapleurally,[24] intrapericardially [25] or subcutaneously.[26] In fact in a certain type of heart disease talc has been recommended to produce pericardial adhesions in an attempt to promote better collateral circulation.

In 1923 Roth [27] published the first contribution to the clinical chapter of postoperative complications arising from dusting powders. In this instance the dusting powder was lycopodium spilled from a glove which tore during a laparotomy. The results of this accident were three subsequent laparotomies for adhesive intestinal obstructions supposedly due to tuberculosis (many miliary nodules were found on the peritoneum) until pathologic examination disclosed that the milia represented foreign body reactions to spores of lycopodium. In 1933 Antopol [1] reported 6 cases of complications resulting from lycopodium spores in the urinary bladder, testicle, kidney, peritoneal cavity, neck and female breast. In the same paper Antopol recorded the first case of intraperitoneal granuloma due to talc. Antopol's description of the microscopic appearance of the lesions resulting from the contamination of the peritoneum with these dusting powders remains as accurate today as

Fig. 2.—Same section as shown in figure 1 illuminated by polarized light. Talc crystals scintillate. Magnification 116 diameters.

when it was written, ten years ago. In the instance of lycopodium the offending agents are the lycopodium spores, whereas in the instance of talc they are the talc

16. Kronenberg, M. H.: Dust Dangers Exposed (Dusting of Rubber Gloves with Talc), Mod. Hosp. **49:** 84 (Aug.) 1937.
17. Martin, Hippolyte: Nouvelles recherches sur la tuberculose spontanée et expérimentelle des séreuses, Arch. de phys. norm. et path. **8:** 49, 1881.
18. Muscatello, G.: Ueber den Bau und das Aufsaugungsvermögen des Peritonäum, Virchows Arch. f. path. Anat. **142:** 327, 1895.
19. Bezzola, Carlo: Sulla produzione sperimentalle e sulla istogenesi di alcune neoformazioni inflammatorie a cellule giganti, Pathologica **4:** 55, 1912.
20. von Podwyssozki, W.: Zur Frage über die formativen Reize (Riesenzellengranulome durch Kieselguhr hervorgerufen), Beitr. z. path. Anat. u. z. allg. Path. **47:** 270, 1910.
21. Lambert, Robert A.: The Life of Tissues Outside the Organism from the Embryological Standpoint, Tr. Cong. Am. Physicians & Surgeons **9:** 91 (May 6 and 7) 1913.
22. Marchand, Felix: Die Veränderungen der peritonealen Deckzellen nach Einführung kleiner Fremdkörper, Beitr. z. path. Anat. u. z. allg. Path. **69:** 1, 1921.
23. Antopol.[1] Fienberg.[3] Owen.[3] Ramsey and Douglass.[4] McCormick and Ramsey.[5] Byron and Welch[6] Ramsey.[7] German.[8]
24. Bethune, Norman: Pleural Poudrage, J. Thoracic Surg. **4:** 251 (Feb.) 1935.
25. Thompson, S. A.: Development of Cardiopericardial Adhesions Following Use of Talc, Proc. Soc. Exper. Biol. & Med. **40:** 260 (Feb.) 1939.
26. Antopol and Robbins.[12] Erb.[13] Antopol.[1] Fienberg.[3] Ramsey and Grieco.[14] Cline.[15]
27. Roth, Hans: Ueber Fremdkörpertuberkulose des Bauchfells, Frankfurt. Ztschr. f. Path. **29:** 59, 1923.

crystals (predominantly magnesium silicate). The spore or the talc crystal forms the center of a tubercle-like structure made up of lymphocytes, epithelioid cells and giant cells (of both foreign body and tumor giant cell types). We might add, based on our experiments, that these tubercle-like structures rarely show any central necrosis, although central caseation necrosis may occur. Neither the macroscopic nor the microscopic anatomy of these lesions is as important as are the end results of their formation, namely a fibrosis which produces intraperitoneal adhesions. In our experimental animals we found all types of adhesions, ranging from a massive occlusion of almost the entire peritoneal cavity to less massive localized adhesions of stomach, spleen, liver and omentum or intestinal loops, or merely thin adhesive bands of fixed omental strands that not infrequently caused death from intestinal obstruction in our animals.

Any attempt to find a substitute for talc must be based on two fundamental considerations: 1. The substitute powder must possess such a degree of actual or potential solubility as to be disposed of rapidly and completely by some form of peritoneal or tissue absorption. If this is not true, the powder collects in the peritoneal cavity as masses or plaques which induce foreign body granulomas, which in turn result in adhesions; or the powder sets up foreign body reaction in wounds or on mucous membranes. 2. The powder must possess such a degree of insolubility as to withstand steam sterilization without losing that dusting property which serves to prevent the glove surfaces from adhering.

Our search for a substitute for talc followed three distinct lines. One of us (M. G. S.) selected "prepared chalk" because it has been used for years as a face powder by women and because Miller and Sayers [28] have shown that when injected into the peritoneal cavities of experimental animals it is eventually absorbed without any consequent ill effects. However, when we injected it into our animals we found that although it was absorbed eventually (five to six weeks) it nevertheless, during the early period following injection, induced granulomas and peritoneal adhesions. In time these granulomas tended to disappear and the adhesions to thin out, but we could demonstrate some menacing intraperitoneal adhesions and strands eight weeks after injection.

Another one of us (F. H. K.) selected cornstarch as a promising substitute for talc because of its admirable dusting quality and its appealing smoothness. Furthermore, there were rational reasons for assuming that it would be taken care of by the diastastic action of the peritoneal fluid and thus be rendered safely absorbable. These assumptions were borne out by our animal experiments, which demonstrated that rats would dispose of an intraperitoneal dose of starch comparable to 1½ pounds (0.68 Kg.) injected into a human being of average weight (150 pounds, or 68 Kg.). The animals, within twelve to twenty-four hours after intraperitoneal injections of starch, showed complete absorption of 3 cc. of a 10 per cent suspension without a vestige of any kind of local or general undesirable effect. These findings are in contrast to the demonstrated chemotactic effect of starch recorded by Chambers and Grand [29] and Kile.[30] This discrepancy is probably due to the fact that in our experiments the starch was injected into the peritoneal cavity, whereas the other investigators made their injections into the subcutaneous tissue. We encountered much difficulty however in the fact that, when we attempted to sterilize starch powdered rubber gloves by autoclaving, the starch gelatinized on the glove surfaces, causing them to adhere and the whole glove to stiffen and glaze. There is reason to believe that it may be possible to develop a special starch powder that will not gelatinize during steam sterilization. This is a consummation devoutly to be wished and for which at present the Research Department of the Corn Products Refining Company is working.

One of us (D. J. V.), with the foregoing considerations in mind but nevertheless on solely empirical grounds, selected potassium bitartrate as fulfilling the necessary requirements. This powder is sufficiently insoluble (0.37 Gm. per hundred cubic centimeters of water at 0 C. and 6.1 Gm. per hundred cubic centimeters at 100 C.) to preserve its powdering effect after autoclaving. Studies of the pharmacologic action of the tartrates in man and experimental animals by Underhill and his co-workers,[31] Salant and his co-workers,[32] Post [33] and others reveal that only large doses are toxic. It has been shown that the toxic dose in the experimental animal is 0.5 Gm. per kilogram of body weight administered subcutaneously, or about 1¼ ounces (35 Gm.) in a man weighing 150 pounds. Our studies show that in a carelessly powdered glove as much as 100 mg. of tartrate may collect in each fingertip. Assume for the sake of argument that gloves have been carelessly prepared and that during an operation ten finger ends were torn, spilling 1,000 mg. of potassium bitartrate in the peritoneal cavity, there then would have been scattered only one thirty-fifth of the toxic dose for animals. One does not have to worry about the bitartrate powder on the surface of the gloves, because, unlike talc, it washes off easily and completely, before operation.

MATERIALS, METHODS AND RESULTS

We studied twenty-four different powders: calcium carbonate (precipitated), calcium gluconate, calcium citrate, calcium phosphate (dibasic), calcium phosphate (tribasic), calcium tartrate, calcium d-malate, magnesium bicarbonate, magnesium carbonate, magnesium phosphate (dibasic), magnesium-ammonium-phosphate, magnesium tartrate, potassium bicarbonate, sodium bicarbonate, sulfanilamide, talcum and potassium bitartrate. Seven different forms of starches were also tried: cornstarch, arrowroot starch, soluble starch, rice starch, Linit starch,[34] special starch [34] and amylocellulose.[35] These studies were directed toward determining primarily whether or not the various powders possessed such dusting properties as to permit the gloves to come

28. Miller, John W., and Sayers, R. R.: The Physiological Response of the Peritoneal Tissue to Dusts Introduced as Foreign Bodies, Pub. Health Rep. **49:** 80 (Jan. 19) 1934; Microscopic Appearance of Experimentally Produced Dust Nodules in the Peritoneum, ibid. **50:** 1619 (Nov. 15) 1935; The Physiological Response of Peritoneal Tissue to Certain Industrial and Pure Mineral Dusts, ibid. **51:** 1677 (Dec. 4) 1936.

29. Chambers, R., and Grand, C. G.: The Chemotactic Reaction of Leukocytes to Foreign Substance in Tissue Culture, J. Cell & Comp. Physiol. **8:** 1 (April) 1936.

30. Kile, R. L.: Treatment of Lupus Vulgaris by Injections of Starch, Arch. Dermat. & Syph. **39:** 471 (March) 1939.

31. Underhill, F. P.; Leonard, C. S.; Gross, E. G., and Jaleski, T. C.: Studies on the Metabolism of Tartrates, J. Pharmacol. & Exper. Therap. **43:** 351 (Oct.) 1931.

32. Salant, W., and Swanson, A. M.: The Influence of Diet on the Toxicity of Sodium Tartrate, J. Pharmacol. & Exper. Therap. **11:** 27 (Feb.) 1918.

33. Post, Wilber E.: The Effect of Tartrates on the Human Kidney, J. A. M. A. **62:** 592 (Feb. 21) 1914.

34. Courtesy of the Corn Products Refining Company.

35. Courtesy of the Corn Starch Division of Anheuser-Busch Inc.

out of the process of steam (autoclave) sterilization in adequate condition. Many of the powders we tried met this test successfully because most of them are sufficiently insoluble. With the starches, however, we were baffled by the gelatinization which resulted from sterilization and rendered the gloves unusable.

Fig. 3.—Agar plate culture of Staphylococcus aureus showing clear, bacteria free zone around potassium bitartrate focus.

The second step consisted in testing the physically satisfactory powders on white rats (150 to 350 Gm. in weight) by injecting sterile watery suspensions of varying concentrations (usually 2 cc. of 5 per cent solution) into the peritoneal cavities. We made in all 194 experiments on 194 individual rats. At intervals varying from five minutes to twenty-four weeks after injection the rats were killed, autopsies performed and gross and microscopic studies made of pathologic lesions.

The results of the experiments may be summarized very briefly by saying that, with one exception, every powder that successfully met the test of steam sterilization produced pathologic lesions of one type or another in the peritoneal cavities of the test animals, i. e. powder plaques, granulomas, adhesions or peritoneal serous exudates. The one exception was potassium bitartrate, which, whether it was strewed on the abdominal viscera through a laparotomy wound or injected into the peritoneal cavity as a watery suspension in varying strength, was rapidly disposed of without causing even the slightest untoward toxic or physical effects, local or general, in any of our experimental animals. Since there is no certain information as to how potassium bitartrate is disposed of after its entrance into the peritoneal cavity, we are making a special but so far inconclusive study of this point. However, we are assured by our work both of its rapid absorption and of the absence of any symptoms of toxicity with appropriate dosage.

It is a notable fact that potassium bitartrate of a mesh of from 210 to 270 seems to powder gloves better than does the finer mesh powder. We therefore recommend the coarser mesh (210 to 270), which in reality is the commercial product (cream of tartar) even though it feels a trifling bit more gritty to the hands of the surgeon. We are told by the Mallinckrodt Chemical Works that the price ranges around 60 cents a pound, depending on the size of the package.

As a practical test we have placed the bitartrate powder in the operating rooms of the Washington University School of Medicine (Barnes Hospital), the Jewish Hospital, De Paul Hospital and our own Barnard Free Skin and Cancer Hospital. When the standard technic for rubber glove sterilization was followed (subjecting the powder, either in gauze sachets or in metal or glass shakers, and subjecting likewise the powdered gloves to 15 pounds of steam pressure for fifteen minutes) we got unanimously favorable reports. We find that when properly sterilized we can repeat the sterilization of the same batch of bitartrate more than half a dozen times without causing any deterioration of the powder. On the other hand, either too much heat or too long an exposure to the proper degree of heat ruins both the gloves and the dusting effect of the powder, discoloring and caking it. In this connection it is important to remember that in contrast to talc with its heavy bacterial and spore content the bitartrate is actually bacteriostatic and relatively innocuous, from the point of infectivity, even before sterilization.

In attempting to determine the effect of potassium bitartrate on pyogenic bacteria, agar plates were seeded by pouring an evenly dispersed broth suspension of staphylococci (Staphylococcus aureus) and Escherichia coli over the plate surface. A loopful of potassium bitartrate was transferred to one or several evenly distributed points on the seeded agar surface. Within twenty-four hours the staphylococci and E. coli had grown sufficiently to make it possible to evaluate the results of the experiments. The organisms studded the agar surface except in those small areas where the potassium bitartrate was planted. A clear zone 1.5 cm.

Fig. 4.—Agar plate culture of colon bacillus showing clear, bacteria free zone around potassium bitartrate focus.

in diameter free of all growth surrounded the potassium bitartrate. The ability of the potassium bitartrate to inhibit the growth of the bacteria, namely, bacteriostasis, is apparently accomplished by raising the hydrogen ion concentration (lowering the p_H) of the agar at the bitartrate site. No surgeon will fail to grasp and appreciate the undoubted clinical value of the phenomenon of bacteriostasis. Figures 3 and 4 demon-

strate the bacteriostatic property of potassium bitartrate on staphylococci and E. coli cultures.

On the other hand, talcum had no such effect on the growth of staphylococci or E. coli, as evidenced by the fact that the bacteria grew unhampered with no evidence of the slightest antibacterial action.

CONCLUSIONS

1. Talcum powder is, under any circumstance, a grave menace in surgery. Once having gained entrance into the animal organism, this powder sets up a reactionary, productive inflammation (fig. 5) that is permanent and progressive and that may be provocative of almost insuperable complications. Furthermore, postoperative residual talcum has been demonstrated by one investigator in various intra-abdominal viscera in 80 per cent of patients he examined.[8]

2. It is certain that even meticulous care in washing off the surface of rubber gloves before operating does not guarantee against contamination of the operative field with talc.

3. The difficulty in substituting for talc lies in the fact that an insoluble powder like talc (hydrous magnesium silicate) sets up a granulomatous foreign body reaction, whereas a soluble dusting powder dissolves during the process of sterilization of the gloves, rendering them adherent and thus difficult or impossible to put on. Dry sterilization of the gloves might be regarded as a solution of this difficulty, but it does not meet the rigid requirements of aseptic surgery and is highly destructive to the life of the gloves. Boiled gloves are sloppy and generally undesirable.

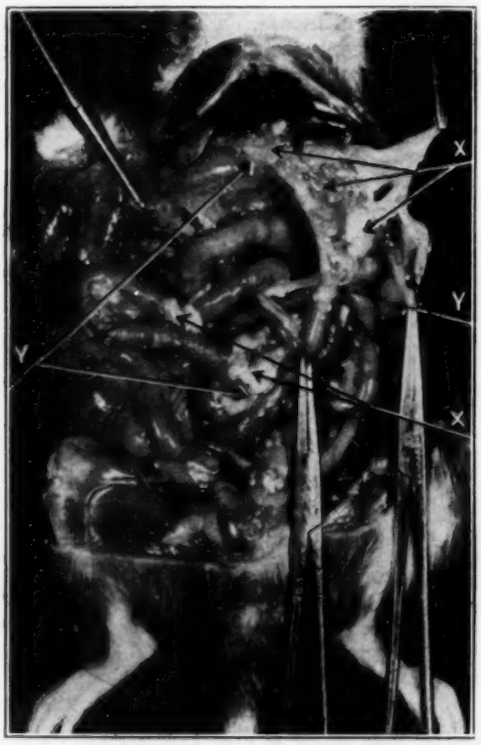

Fig. 5.—Intraperitoneal adhesions (*Y*) and granulomas (*X*) ten days after injection of watery suspension of talc (2 cc., 5 per cent) into peritoneal cavity of a rat. See figure 6 for contrast.

4. Potassium bitartrate meets the physical requirements imposed by steam sterilization. It is readily and harmlessly disposed of by the body tissues and fluids. It causes no consequent peritoneal adhesions (fig. 6). Since, therefore, there are no demonstrable risks attendant on its use, it may be recommended as a substitute for talc in powdering rubber gloves. We have received no complaints regarding undesirable skin effects.

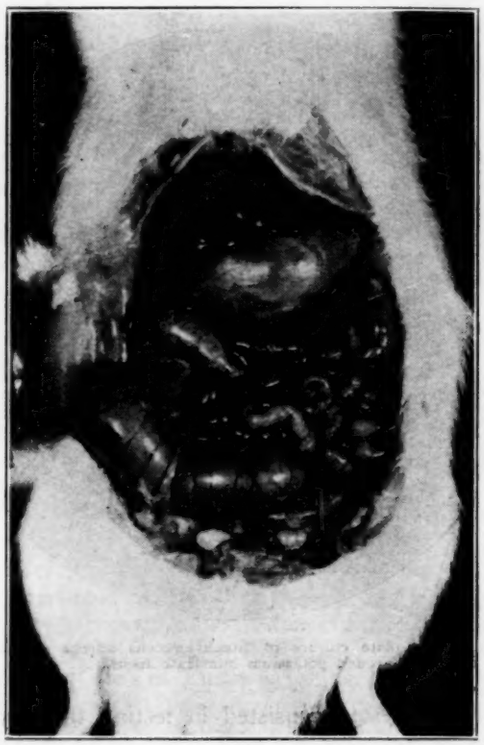

Fig. 6.—Peritoneal cavity of rat entirely free from adhesions ten days after injection of watery suspension of potassium bitartrate (2 cc., 5 per cent). See figure 5 for contrast.

5. Potassium bitartrate possesses a certain degree of bacteriostasis for the colon bacillus and Staphylococcus aureus.

6. It is important that in the process of sterilization the potassium bitartrate should be subjected only to the now standard and accepted technic for sterilizing rubber gloves, namely fifteen minutes of autoclaving under 15 pounds of steam pressure.

NOTE.—Since this paper was submitted for publication, we have received reports indicating that potassium bitartrate tends to shorten the life of rubber gloves. On making tests, we found that tartrated gloves would stand from seven to ten separate sterilizations, whereas talcum powdering permitted from twelve to twenty sterilizations (pure rubber gloves). We feel that this comparatively insignificant economic factor should not be permitted to weigh against the grave disadvantages attributable to the use of talcum, which raises both postoperative morbidity and mortality rates.

Beginning of Ophthalmology.—Ophthalmology began with the ancient Greek, Roman and Arabian surgeons who operated on cataracts. Their operation, called "couching" or "inclining" a cataract, consisted merely of perforating the eye with a needle and pushing the clouded lens backward into the posterior chamber of the eye out of the line of vision. It was a hazardous procedure, for sight was lost entirely in two out of every five eyes thus treated. In the fourteenth century blind King John of Bohemia had an eye surgeon thrown into the Oder River when he failed to cure his blindness by couching.—Haagensen, C. D., and Lloyd, Wyndham E. B.: A Hundred Years of Medicine, New York, Sheridan House, Inc., 1943.

CLAWING OF THE GREAT TOE FOLLOWING IMPROPER APPLICATION OF PLASTER

LIEUTENANT ARTHUR M. PRUCE
AND
MAJOR WALTER H. HAGEN
MEDICAL CORPS, ARMY OF THE UNITED STATES

Hundreds of patients have been referred to the Physical Therapy Department by the orthopedists of Stark General Hospital during the past eighteen months. They were sent, for the most part, for rehabilitation of muscles and joints of the lower extremities following severe injuries and infections that were, of necessity, immobilized over long periods of time. In the restoration of function and mobility to these injured extremities, 8 cases of clawing of the great toe, not present at the time of injury, were observed by one of us (A. M. P.). In this group of 8 cases the deformity appeared in the presence of chronic infection, prolonged healing following surgery of the foot, and with osteomyelitis resulting from gunshot wounds or compound fractures, where prolonged immobilization is imperative.

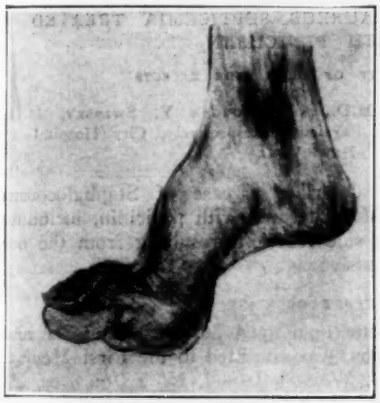

Fig. 1.—Clawing of the great toe, medial aspect.

The only author to have recognized a similar entity is James Mennell in Sir Robert Jones's book "Orthopedic Surgery of Injuries," [1] who mentions a hallux rigidus deformity of the great toe in connection with gunshot wounds of the lower extremity.

Mercer,[2] quoting Todd, describes clawing of the toes as "a dropping of the metatarsal heads below the normal level, alteration of their line of action which leads to pulling up of the proximal interphalangeal joint of the toes, with a secondary important effect of shortening the course of weakened extensor muscles so that they then adaptively contract (and may, in this way, mask their original weakness)." This condition is seen in children following poliomyelitis, infections of the sole of the foot, peroneal muscle atrophy, as part of the little understood picture of Friedreich's ataxia, and in other similar nervous system degenerations or failures of development.

The accepted technic for the immobilization of the leg and foot in a plaster cast made with a "reverse or reinforcement," applied to the posterior aspect of the leg, is to carry the edge of the cast beyond the toes on the sole of the foot (in order to protect them from the weight of the bedclothes) and to the base of the toes on the dorsum of the foot. The longitudinal arch is routinely molded, and the metatarsophalangeal joint of the great toe is usually immobilized in extension. In the application of this standard type of cast, force is exerted to maintain the foot at right angles to the leg, i. e. in a neutral position. By incorrectly placing traction on the projecting end of the "reverse" to dorsiflex

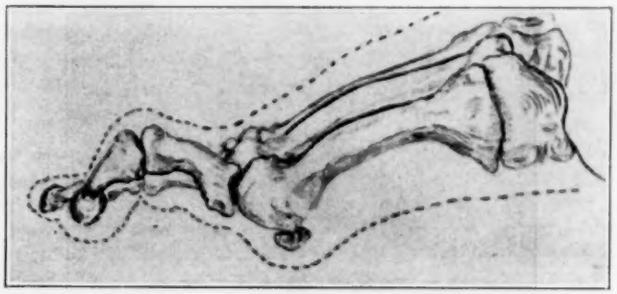

Fig. 2.—Schematic view.

the foot, the projecting plantar toe piece is rounded off in such a manner as to produce further extension of the metatarsophalangeal joint and a depression of the metatarsal head. A bed in the soft plaster is often unintentionally molded, in which the great toe is held with the interphalangeal joint in flexion, and, since the extremity is kept immobile while the cast dries, a well defined ridge under the interphalangeal joint is formed —thus the clawing of the great toe. The fixed extension of the metatarsophalangeal joint in itself may cause the clawing, since the interphalangeal joint then tends to flex in order to maintain equilibrium and muscle balance.

Of the 8 cases observed, 1 was treated here from the beginning, the deformity developing under our own eyes. The remaining 7 patients were transferred from other hospitals, and this deformity was observed only after the removal of the plaster. When the deformity is recognized, it is relatively fixed and extremely resistant to treatment. The most intensive and prolonged physical therapy proved of little value; the osteomyelitis subsided, the fracture healed, but the clawing of the great toe persisted, resulting in metatarsalgia and a poor walking gait. It prevented running and remained a site of local irritation, provoking corns and callus formation.

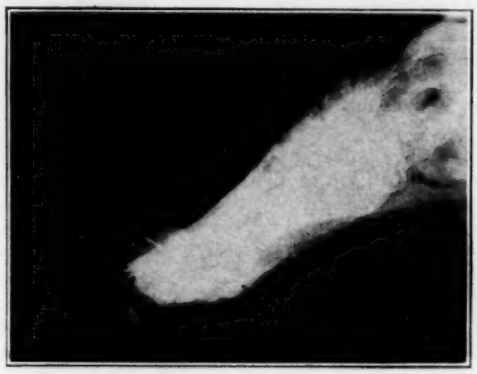

Fig. 3.—Hyperextension of the metatarsophalangeal joint of the great toe and flexion in the interphalangeal joint.

From a military standpoint this is a very grave matter, for it prevents the soldier from returning to full field duty. Correction has been a difficult problem. To date, surgical intervention has not been resorted to, primarily because most of the patients under observa-

Read in abstract before the Congress of Physical Therapy, Eastern Section, New York, April 10, 1943.
From the Physical Therapy Section (Lieutenant Pruce) and the Orthopedic Section (Major Hagen), Stark General Hospital.
The photographs are by Capt. Alfred J. Suraci, M. C., Surgical Service, S. G. H., the drawings by Private Eugene M. Massin, S. G. H.

1. Jones, Sir Robert: Orthopedic Surgery of Injuries, vol. 2, Oxford Medical Publications, 1921.
2. Todd, in Mercer, Walter: Textbook of Orthopedic Surgery, ed. 2, Baltimore, William Wood & Co., 1938, p. 747.

tion were again transferred to other hospitals. Several men have recovered enough to make surgery unnecessary.

Prevention of this condition is the most important aspect of this report. More care must be exercised in the application of foot plaster splints. If a "reverse"

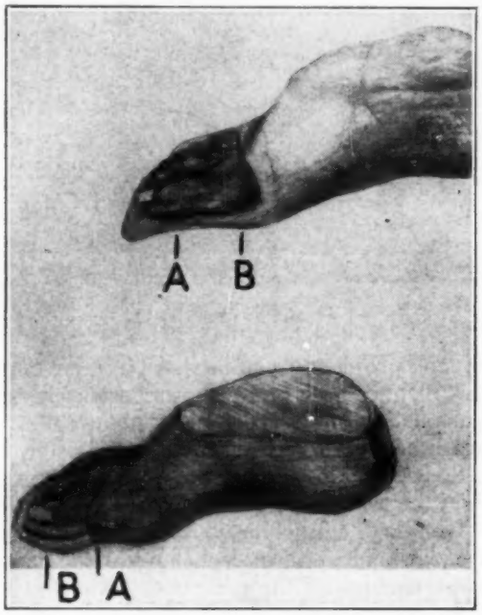

Fig. 4.—Above, cast properly applied: *A*, toe piece in straight line; *B*, metatarsophalangeal joint of great toe free. Below, cast improperly applied: *A*, bed of plaster under great toe; *B*, ridge under interphalangeal joint.

or "reinforcement" is used, the sole of the foot should be held so that the plantar toe part of the cast is carried in a straight plane to the tips of the toes and not used as a means of obtaining dorsiflexion of the foot. After several rolls of plaster are applied, both metatarsal and longitudinal arches are preserved by molding the plantar surface of the cast with the heel of the hand. Finally

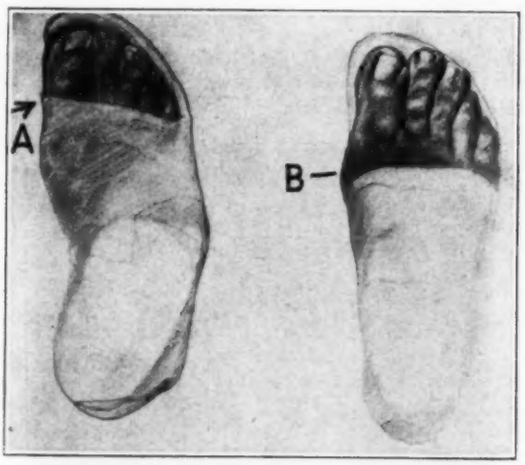

Fig. 5.—*A*, immobilization of metatarsophalangeal joint by dorsal edge of cast. *B*, joint free.

the dorsal edge of the foot cast is carried to the interdigital folds of the toes, except for the great toe, and here the metatarsophalangeal joint is left free. Early exercise will prevent or combat edema in this area, and, with the first changing of the cast, the distal third of the dorsum of the foot may be left free to permit exercise of the forefoot in all planes of motion.

By simple adjustment of customary methods of the application of plaster in the treatment of lower leg injuries, this distressing disability can be anticipated and thus prevented.

SUMMARY AND CONCLUSIONS

1. A new and previously not described factor in the causation and prevention of the clawing of the great toe has been observed in a series of 8 cases treated in the Physical Therapy and Orthopedic sections of Stark General Hospital.
2. The cause of the clawing is believed to be due to improper applications of plaster foot splints.
3. A method of prevention by proper splinting has been devised.
4. The development of this deformity can seriously retard full recovery and may prevent the return of otherwise healthy soldiers to full military duty.

Clinical Notes, Suggestions and New Instruments

STAPHYLOCOCCUS AUREUS SEPTICEMIA TREATED WITH PENICILLIN

WITH REPORT OF DRUG SIDE EFFECTS

DAVID STANLEY LIKELY, M.D., AND MORGAN Y. SWIRSKY, M.D.,
Physician and Resident Physician, Respectively, City Hospital
NEW YORK

The following report describes a case of Staphylococcus aureus septicemia successfully treated with penicillin, including the presentation of some side reactions resulting from the use of this material intravenously:

REPORT OF CASE

History.—P. K., a white man aged 36, hoist engineer and former sailor by occupation, was admitted to the First Medical Service of City Hospital, Welfare Island, N. Y., on Dec. 29, 1942 with chief complaints of chest pains, fever and malaise of forty-eight hours' duration. He had apparently enjoyed good health prior to the onset of the present illness and gave no history of recent contact with a sick person, bone injury or superficial wounds. For two days prior to admission he complained of repeated chilly sensations without frank chills, fever, malaise, vague bilateral chest pains, mild cough productive of small amounts of whitish sputum, headache, weakness, anorexia and constipation, for which he treated himself at home with "Bromo-Quinine" and "phenolphthalein."

The patient sailed the seas from 1932 until 1940, and, although he was often in the Mediterranean Sea area and in South America, he never had malaria or any other illnesses so prevalent in these localities. In 1935 and again in 1938 he suffered with pneumonia, while in 1937 he contracted gonorrhea, which was treated with sulfanilamide. For a short time in 1939 the patient had furunculosis of the neck, arms and forearms which subsided spontaneously without specific treatment.

Physical Examination.—On entry the patient appeared asthenic, pale, fairly well nourished and not acutely ill. The pupils were round, regular, and equal in size and reacted well to light and in accommodation. The nasal septum was intact and deflected to the left with the presence of moderate mucopurulent nasal discharge. Oral hygiene was good and the pharynx was moderately injected with some postnasal drip. Vesicular and crusted herpetic lesions were present on the upper and lower lips. The neck was supple and no nodes were palpable. The heart was apparently not enlarged, rhythm was

From the First Medical Service, City Hospital.
This study was conducted under the supervision and coordinating auspices of the Committee on Chemotherapeutic and Other Agents of the National Research Council, acting for the Committee on Medical Research of the Office of Scientific Research and Development. The penicillin used was provided by the OSRD under the terms of a contract with the Massachusetts Memorial Hospitals.

regular and tones were of good quality with no audible murmurs. The blood pressure was 116 systolic, 70 diastolic. Chest expansion was symmetrical and the lungs were normal. The abdomen was soft with no palpable viscera and no apparent costovertebral angle tenderness to fist percussion. Reflexes were present and active and there was no sign of articular pathologic change. Over the torso and extremities were numerous variable sized nonhemorrhagic erythematous macular lesions which were flat and nonpruritic and did not fade on pressure. The temperature was 102 F., pulse rate 114 and respiratory rate 28.

Clinical Course.—The patient was put to bed and treated with supportive measures for the first fourteen hospital days. The admission urinalysis was negative, as were numerous repeat examinations. The red blood cell count was 4,200,000 with 85 per cent hemoglobin (Sahli) and the white blood cell count was 9,600 with 74 per cent polymorphonuclears, 3 per cent band forms, 1 per cent eosinophils and 22 per cent lymphocytes. The blood Wassermann test was negative, nonprotein nitrogen 30, blood sugar 84 and icterus index 4.

The initial throat culture showed proteus-like organisms, the urine culture a mixed Staphylococcus albus and streptococcus infection, while the blood culture, initially reported as negative, showed a delayed growth of Staphylococcus aureus. The sputum was negative for tubercle bacilli and pneumococci; the sedimentation rate was slightly accelerated. A chest roentgenogram showed no evidence of pulmonary consolidation.

On the first hospital day, after a short period of well-being with drop in fever, the patient suddenly complained of chilly sensations followed by mild shaking rigors with rise in temperature to 103.8 F., pulse rate to 100 and respiratory rate to 24. He complained of vague pains in his left chest, mild articular pains in the lower extremities, and the only new physical finding of note was the appearance of a new crop of erythematous macular lesions, similar to those on entry. The patient did not look particularly ill. The febrile reaction subsided in about twelve hours and the accompanying signs and symptoms rapidly cleared up. A blood culture taken at this time was positive for Staphylococcus aureus.

Similar febrile episodes preceded by frank chills and accompanied by similar skin eruptions plus some papular lesions occurred on the fifth, ninth and eleventh hospital days, while febrile reactions, not preceded by rigors, occurred on the thirteenth, fifteenth and seventeenth hospital days. The temperature curve was septic in type with spikes up to 103-105 F., usually lasting eight to twelve hours. Repeated white blood cell counts ranged from 14,700 to 22,080 cells with 71 to 81 per cent polymorphonuclears. Sedimentation rates were slightly accelerated. A blood culture taken in the ninth hospital day showed a delayed growth of type II meningococci, confirmed by the Department of Health Laboratory, but a meningococcus agglutination test by the Department of Health Laboratory was negative.

Multiple blood cultures were taken during the period of the febrile episodes. One drawn on the morning of the eleventh hospital day showed no growth, while another one taken later the same day at the time of a chill showed a few diphtheroid organisms. However, the blood culture on the fifteenth hospital day was reported as positive for Staphylococcus aureus.

Agglutination tests for typhoid, paratyphoid, dysentery, brucella and tularemia organisms were negative. Repeated peripheral blood smears during various portions of these malaria-like febrile cycles failed to disclose any of the parasites, and a study of the sternal bone marrow was noncontributory. Feces cultures were negative for dysentery, typhoid and paratyphoid organisms, and the heterophile antibody reaction was negative. A second throat culture showed some staphylococci, and another urine culture again showed Staphylococcus albus and streptococcus organisms. Roentgenograms of the mastoids, paranasal sinuses and ribs failed to disclose evidence of focal infection. Cystoscopy and retrograde pyelography revealed a normal genitourinary tract, but culture from the right kidney urine revealed Staphylococcus albus. The prostatic smear was negative for gonorrhea but did show some gram positive cocci. An electrocardiogram was normal.

Despite the failure to find malarial parasites in the blood stream and because of the inability to obtain repeated positive blood cultures due to delayed growth of the organisms, coupled with the malarial type of temperature course, it was decided to use quinine as a therapeutic test, but a three day trial produced no effect whatever. On the seventeenth hospital day the patient was started on sulfathiazole in adequate dosage (4 Gm. initially and 1.5 Gm. every four hours night and day) in view of the positive Staphylococcus aureus blood culture of the fifteenth hospital day. During the succeeding four days he continued to have a septic temperature ranging from 98.6 to 103.8 F. with chilly sensations, vague aches and pains but no rash. A blood culture taken on the seventeenth hospital day was again positive for Staphylococcus aureus, while another one on the twenty-first day showed a delayed growth of staphylococci not differentiated as to type. The intradermal test with staphylococcus antitoxin was strongly positive and this agent was not used.

The patient received a series of blood transfusions for supportive effects, despite lack of anemia. On the twenty-first hospital day the temperature came down to normal and stayed so for two additional days. At this period the sulfathiazole dosage was reduced to 1 Gm. every fourth hour. On the evening of the twenty-fourth hospital day the patient had a chill; the temperature rose to 101 F. and then continued to rise in step-ladder fashion through the twenty-seventh hospital day to 104.6 F. With this rise in temperature there was a return of his previous symptoms of vague joint, chest and abdominal pains. There was pronounced intoxication, the sedimentation rate became very rapid, the white blood cell count was 16,250 with 63 per cent polymorphonuclears and 10 band forms, and the patient's status became critical, almost moribund. The sulfathiazole blood level was 7.0 mg. per hundred cubic centimeters. An erythematous, tender, nodular eruption appeared on the face, neck and extremities differing from the previous eruptions in its nodularity and tenderness, but the color of the two types was the same. These findings might have been due to drug intoxication fever and reaction, but at the time we were convinced that it was a recrudescence of the blood stream infection.

The sulfathiazole was discontinued on the morning of the twenty-seventh hospital day and at 1 p. m. the administration of penicillin sodium was started by the intravenous route. There was a rise in temperature at 4 p. m. to 104.6 F. followed by a rapid and continuous drop to 99 F. by 4 p. m. of the twenty-eighth hospital day. Thereafter the temperature continued to be normal, reaching 100 F. only on two or three occasions, and the white blood cell counts and sedimentation rates came back to normal. A blood culture taken on the thirty-second hospital day, five days after the institution of penicillin, showed rare colonies of nonhemolytic Staphylococcus albus, while one on the forty-fifth day contained only some diphtheroid organisms.

The patient was discharged on his fifty-seventh hospital day (February 24), but blood cultures drawn on the forty-eighth and fifty-seventh hospital days, initially reported as negative, showed delayed growths of Staphylococcus albus and staphylococci slightly aureus, respectively. Following discharge from the hospital he has remained well and asymptomatic to date (May 16) and has resumed work in a shipyard. A blood culture taken on the sixteenth day after discharge showed less than one very attenuated Staphylococcus albus colony per 5 cc. of blood, while another on the thirtieth day showed only one hemolytic staphylococcus colony on the entire plate. Repeated blood cultures since that time have been negative to date and blood counts and sedimentation rates normal. A repeat meningococcus complement fixation test was negative, while the staphylococcus agglutination tests showed complete agglutination through 1:6,400 dilution for both Staphylococcus aureus and albus (Department of Health Laboratory).

COMMENT

Penicillin Dosage and Reactions.—The patient received daily 60,000 Oxford units of penicillin sodium for three days, 30,000 units for ten days and 20,000 units for three days, all in divided doses intravenously. On the second day of penicillin therapy

each injection was accompanied by a moderately severe frontal type of headache lasting on the average about forty minutes after completion of the injection, and there were no accompanying photophobia, vertigo, tinnitus, blood pressure, fundi or neurologic changes. These reactions persisted over a two day period. During the sixth day of the penicillin routine the patient began to complain of severe cramplike pains in the calf muscles of the legs, starting five to six minutes after the injection was finished, lasting forty-five to sixty minutes and being followed by dull aching pains in these areas for variable periods of time. There were no associated local tenderness or reflex changes, and these reactions lasted only two days. The study of serial blood smears after the starting of penicillin revealed the presence of a definite lymphocytosis with decrease in the number of polymorphonuclear cells, but after the drug was discontinued the differential white blood cell count returned to normal.

Twelve blood cultures were taken during the period of hospital observation.[1] Eight proved positive for staphylococci, four aureus, three albus and one unidentified. The early staphylococcus cultures were aureus, the later ones, taken after the first month, both aureus and albus. The lag periods of growth usually varied from four to six days, although one culture became positive only on the seventeenth day. The later cultures showed a diminishing number of colonies, sometimes only one colony in 2 to 5 cc. of blood. The meningococcus type II was isolated from the culture taken on the ninth day. The agglutination tests performed by Miss S. A. Scudder, bacteriologist, with blood serum obtained on the day of discharge revealed a titer of 1:6,400 with Staphylococcus aureus isolated on the fifteenth day and Staphylococcus albus isolated on the fifty-seventh day, and a titer of 1:800 with Staphylococcus albus isolated on the forty-eighth day. The agglutination tests against meningococcus, performed by Mrs. Falk of the New York City Board of Health, were negative. Three blood cultures were taken when the patient returned for a follow-up. The first, thirty days after discharge from the hospital, showed rare Staphylococcus aureus; two subsequent cultures taken on the thirty-seventh and fifty-sixth days after discharge remained sterile.

CONCLUSION

We recognize the possibility but doubt the probability that the patient would have recovered without the use of penicillin. The improvement in the general condition and well-being of the patient within twelve hours after the institution of penicillin was dramatic and recovery thereafter was uneventful. However, it should be noted that, despite the use of sufficient sulfathiazole and more than the usually advocated amount of penicillin, the blood cultures only slowly became negative.

THE USE OF THE STETHOSCOPE IN THE PREVENTION OF "BOILER-MAKERS' LARYNGITIS"

L. R. KRASNO, PH.D.; R. J. DE MOTTE, M.D., AND A. C. IVY, PH.D., M.D., CHICAGO

In many industries the existence of noise renders it necessary to shout and strain the voice in order to be heard. This condition gives rise to many cases of laryngitis which can be prevented by the use of a simple communication system.

The stethoscope is an ideal instrument for this purpose. It does not involve intricate electrical appliances and can be carried about free from line wires. The speaker talks through the bell of the stethoscope. This is best accomplished by cupping the hand about the bell and making contact between the mouth and the hand. The receiver listens through the ear pieces. A very clear communication is thus effected with the use of the voice at conversational levels amidst loud noises.

303 East Chicago Avenue.

1. Summary of bacteriologic studies by Dr. James R. Lisa, pathologist, City Hospital.

From the Medical Department, Pullman Standard Car Manufacturing Company, and the Department of Physiology, Northwestern University.

DERMATITIS WITH UNUSUAL DISTRIBUTION FOLLOWING THE USE OF SULFATHIAZOLE

LIEUTENANT THOMAS W. CLARK, MEDICAL CORPS, ARMY OF THE UNITED STATES

The many cutaneous manifestations of acquired sensitivity to the sulfonamide compounds have become well known with the widespread use of these drugs.[1] The present case is reported because of the singular distribution of a dermatitis which broke out on two occasions following the use of sulfathiazole. In both instances it developed on areas of skin exposed to the sun and was limited to these. The case is also reported as an example of a severe reaction following administration of sulfathiazole by mouth ten days after it had been used topically in an ointment.

REPORT OF CASE

J. F., a technical sergeant aged 25, was admitted to an evacuation hospital June 24, 1942 because of a severe dermatitis on his hands, face and neck. Two and a half weeks before admission a few pustules appeared on the chin. A diagnosis of impetigo contagiosa was made, and sulfathiazole ointment was applied daily for four days. Because the lesions did not heal, gentian violet therapy was substituted for the sulfathiazole ointment. After ten days of treatment the pustular eruption had practically disappeared and the patient was allowed to shave. He was given sulfathiazole to take by mouth. He took the first and only dose (1 Gm.) at 7 p. m. By 7:30 his face and hands felt hot and by 8 o'clock a vesicular rash had broken out on his face. He took no more sulfathiazole, reported for sick call the next morning and was sent directly to the hospital.

The patient was on active duty in the South Pacific. He had never taken any of the sulfonamide compounds before the present illness. On admission his face, ears, scalp and neck and the backs of both hands were covered with a severe dermatitis. The eruption also involved the small triangular area of the neck exposed by an open collar and was sharply limited here to the exposed skin. There was vesiculation with weeping and crusting, severe erythema of the involved skin and edema with induration of the subcutaneous tissue. The striking feature was that only those areas of the skin exposed to the sun were involved. The ocular and palpebral conjunctivas were red and injected. The postauricular and cervical lymph nodes were enlarged and tender. Otherwise the results of the examination were negative.

The blood count revealed 5,200,000 red blood cells per cubic millimeter and 16,600 white blood cells. The hemoglobin reading was 100 per cent. The differential count showed neutrophils 58 per cent, lymphocytes 12 per cent, eosinophils 20 per cent, basophils 6 per cent and monocytes 4 per cent. Urinalysis gave normal results.

The vesicles enlarged, and many became confluent during the next few days. The eruption did not spread, but existing lesions showed no evidence of healing. The patient was treated symptomatically with sedatives and fluids. On the sixth day after admission he complained of feeling "groggy and warm." The skin of his hands and face was more flushed than before. During the night his temperature rose to 102 F. By morning the fluid in all the vesicles and bullae had become purulent, and the patient was extremely ill. The loose epidermis was cleared away and a 1 per cent solution of gentian violet was applied to the denuded areas. Fluids were forced and sulfadiazine medication was started, 4 Gm. initially and 1 Gm. every four hours thereafter being given. A blood culture was taken but no growth resulted. Twenty-four hours after the sulfadiazine therapy had been started a scarlatiniform rash was noted on his shoulders, chest and abdomen. The sulfadiazine was stopped and the rash disappeared within forty-eight hours. There was no apparent change in the character of the eruption on the face, neck and hands after sulfadiazine had been given. The patient recovered promptly from the acute systemic phase

From the Fifty-Second Evacuation Hospital.

1. Long, P. H.; Haviland, J. W.; Edwards, L. B., and Bliss, Eleanor A.: The Toxic Manifestations of Sulfanilamide and Its Derivatives with Reference to Their Importance in the Course of Therapy, J. A. M. A. **115**: 364 (Aug. 3) 1940. Chemotherapy in Infectious Diseases and Other Infections, Circular Letter No. 17, issued Feb. 23, 1942, by the Office of the Surgeon General, U. S. A., Washington, D. C. Brooks, Clyde: The Toxic Effects of Sulfanilamide and Sulfapyridine, New Orleans M. & S. J. **92**: 115 (Sept.) 1939. Janeway, Charles A.: The Sulfonamides: I. Their Mode of Action and Pharmacology, New England J. Med. **227**: 989 (Dec. 24) 1942.

of the infection and his temperature dropped to normal within three days. The lesions on his skin healed slowly, however.

Because the patient was going into a combat zone, it was thought important to establish his sensitivity to sulfathiazole. Accordingly, six weeks later 5 per cent sulfathiazole ointment was applied to the back of one hand and a similar amount of 5 per cent boric acid ointment to the back of the other as a control. A few small vesicles appeared under the sulfathiazole ointment within twenty-four hours. The next day the patient was given sulfathiazole by mouth, 0.5 Gm. for three doses. During the night his face became flushed, and by morning the cutaneous areas of his face, ears and neck were red, weeping and crusted, exactly as they had been on admission. These tests left little doubt that the condition of the patient's skin was the result of sensitivity to sulfathiazole.

Ten weeks after admission he was sent back to his unit. The first morning after his return, his face, ears and neck were again covered by a red vesicular eruption, with oozing and crusting. His hands were not involved this time. The explanation for this flare-up was obscure, though it seemed probable that some sulfathiazole ointment had got onto his blankets at the time it was first applied to his face for impetigo and that contact with the ointment on these blankets had caused this latest flare-up. On final discharge he was issued new blankets. When seen one month later he had suffered no recurrences. Because he reacted so violently to sulfathiazole, a notice was attached to his identification tags stating that he was extremely sensitive to this drug.

COMMENT

The distribution of the cutaneous lesions in this case was so definitely limited to the areas exposed to the sun that it was thought there must have been a relationship between the reaction of these portions of the skin to sulfathiazole and the effect of sunlight on the same areas. Photosensitivity of the skin and eyes after the taking of sulfathiazole has been mentioned in the literature.[2] In this case the dermatitis was not precipitated by exposure to sunlight but by the sulfathiazole itself. The first sulfathiazole given to the patient was in an ointment applied to the skin. The patient was ambulatory at this time and thus exposed to strong sunlight most of every day. The dermatitis appeared ten days later, shortly after the administration of the drug by mouth. Therefore it seems probable that sunlight conditioned the skin to a sensitivity to sulfathiazole but did not itself cause the reaction.

Sensitivity in this case was undoubtedly induced by the application of sulfathiazole ointment when the patient was first treated for impetigo contagiosa. He had never taken the drug before. Livingood and Pillsbury,[3] Cohen, Thomas and Kalisch,[4] and Weiner[5] have recently reported similar cases in which sensitivity to sulfathiazole was produced by topical application of that drug. These illustrate the danger of using sulfathiazole ointments without due regard for the onset of reactions.

This man was tested inadvertently for sensitivity to one other sulfonamide compound. He was given sulfadiazine at the time his cutaneous lesions became purulent. Shortly after he took the drug, a rash developed on his trunk and shoulders. The rash was quite different in character from the one due to sulfathiazole. It disappeared after the sulfadiazine was stopped, leaving little doubt that it was due to that drug. It is possible that this reaction to sulfadiazine was related to the sensitivity to sulfathiazole. Instances of one sulfonamide compound sensitizing a person to others have been reported.[6] Unfortunately there was not time to test this man further with other sulfonamide compounds.

SUMMARY

A soldier developed a severe dermatitis resulting from acquired sensitivity to sulfathiazole. The dermatitis was limited to areas of skin exposed to sunlight. Sensitivity was induced by topical application of sulfathiazole ointment. Measures were taken to prevent this soldier from receiving sulfathiazole if injured.

2. Long, Haviland, Edwards and Bliss,[1] Brooks.[1]
3. Livingood, C. S., and Pillsbury, D. M.: Sulfathiazole in Eczematous Pyodermia: Sensitization Reaction to Successive Local and Oral Therapy: Report of Twelve Cases, J. A. M. A. **121:** 406 (Feb. 6) 1943.
4. Cohen, M. H.; Thomas, H. B., and Kalisch, A. C.: Hypersensitivity Produced by the Topical Application of Sulfathiazole, J. A. M. A. **121:** 408 (Feb. 6) 1943.
5. Weiner, A. L.: Cutaneous Hypersensitivity to Topical Application of Sulfathiazole, J. A. M. A. **121:** 411 (Feb. 6) 1943.
6. Nelson, Jack: Acquired Sensitivity to Sulfonamide Drugs, J. A. M. A. **119:** 560 (June 13) 1942.

Special Article

AMERICAN HEALTH RESORTS

THE IMPORTANCE OF TRACE ELEMENTS IN BIOLOGIC ACTIVITY

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These special articles on spa therapy and American health resorts were prepared under the direction of the Committee on American Health Resorts. The opinions expressed are those of the authors and do not necessarily reflect the opinion of the committee. These articles may be published later as a Handbook on Health Resorts.

Research on the effects of natural mineral waters for alleviating human ills is becoming more and more recognized in this country. In this paper I discuss that branch of biochemistry which describes the elements usually present in the body only in small amounts. Their physiologic effects recall those of vitamins and enzymes. The brilliant advances in organic biochemistry during recent years have proved the metabolic effects of organic substances present only in infinitesimal amounts. It is not yet well known that these organic substances are usually linked with metallic ions or mineral elements. The study of mineral elements or mineral metabolism of human beings leads to nutritional problems and discussion of dietary habits and their scientific justification, which are questions of importance for the practitioner. It leads further to discussions of the therapeutic value of natural mineral waters. There is no more urgent time than the present to make all efforts to elucidate the healing value of natural mineral springs to the physicians of this country. It is the duty of the medical profession to use spas and watering places for the health and well-being of the nation. The prospect of scientific development of balneology never seemed to be more favorable than now, because, with the new conception of the biochemical properties of mineral elements, research on natural mineral waters is an important part of research on nutrition. Mineral elements which are essential for our well-being may not always be present in sufficient amount in our food. In natural mineral waters, however, these trace elements are enriched. Therefore during a drinking or bathing "cure" a transmineralization takes place in our body. The vital elements like Fe, Cu, Mn, Zn and Co, if deficient, are compensated, while other trace elements like Hg, Cr and Mo react as true pharmaceutic or therapeutic agents.

In 1927 with Davidson I[1] made the first attempt to interest physicians in natural mineral water from a purely theoretical point of view. In the first section of this paper, entitled "The Significance of Trace Elements in Biologic Processes," it was stated:

We are confronted with the fact that the active substances of a curative water may be present in extremely small amounts and that often only slight traces of a substance suffice to bring about profound biologic changes in animals and man. Every thinking physician who would keep abreast of modern science

From the Research Department of the Saratoga Spa.

1. Baudisch, Oskar, and Davidson, David: Natural Mineral Waters in the Light of Modern Research: The Catalytic Action of the Saratoga Springs, Arch. Int. Med. **40:** 496-520 (Oct.) 1927.

must be conversant with the idea that amounts of substances which are hardly weighable and perhaps only spectroscopically detectable are capable, under certain circumstances, of exerting great biologic effects and are therefore of therapeutic significance. In this respect, modern research in vitamins has brought us much that is astonishing.

During the short time of sixteen years since this was written a remarkable development has taken place in this field, which fifteen to twenty years ago was virgin. It was quite incomprehensible that metallic ions in dilutions of say 1:1,000,000 could be of any value in nutrition or generally in the metabolism of the human body.

The importance of inorganic elements or metallic ions which occur in our body in small amounts or traces has only begun to be appreciated by the medical profession. During the last few years a remarkably rapid development has taken place. New or improved tools like quantitative spectrum analysis and organic chemical reagents have done much to give us more knowledge about the presence and amounts of "trace," "rare" or "minor" elements in different organs of the body and in blood.

The use of natural and radioactive isotopes, the so-called tracer or spy atoms, is of great importance in revealing the fate of trace elements in the living body during metabolism. The use of absorption spectrum methods has also broadened our knowledge concerning the binding of metallic ions in the organic framework and the appearance of metallic complex compounds in the living cell. Hemin, for example, has been found by the spectroscope both in the plant and in the animal kingdom. The similarity between the pigments of plants (chlorophyll) and blood (hem compounds) has been definitely established.[2]

With the spectroscope it has been found that many enzyme systems contain metallic ions as, for example, catalase or polyphenolic oxidase. Since enzymes seem to hold a key position in the chemistry of life, the linkage or binding of inorganic elements with organic systems containing proteins is of paramount importance. About the nature of such bonding I shall have more to say later on in the paper.

Concerning the expressions "trace," "minor" or "rare" elements some corrections are needed. From a biologic point of view there is no difference between main and minor elements, between much and little or between abundancy and traces. Such a distinction holds well in the mineral kingdom. The living cell, however, selects the elements needed for life regardless of the amount present in its surrounding. For example, sea water contains only 50 micrograms per liter of iodine and 1,400 micrograms per liter of fluorine.[3] Iodine probably needed for the life of kelp is concentrated more than a hundred thousand times in the algae while fluorine remains untouched. The same holds for many other elements. The most striking example is iron, which is present in sea water in the very small amount of 2 micrograms per liter. The concentration of iron in the blood of sea animals is astounding. There are only 0.41 Gm. per kilogram of calcium in sea water, but the oyster, for example, builds up its heavy shell of this element, and corals ultimately build up whole islands. It is an unsolved problem how sea plants or animals capture and concentrate the elements absolutely necessary for life. The present paper contributes to this problem.

Elements present in our body in small quantities were considered, only about twenty years ago, as "negligible impurities." The first great active interest in trace metals was shown by the University of Wisconsin and the Agriculture Department in Washington, especially after it was found that certain severe blood diseases in animals were due to deficiency of trace metals such as copper, cobalt, nickel, zinc, manganese or others. Some soil in the United States simply did not contain enough of one or several of these vital elements, and mineral nutrition deficiency diseases were the result.[4]

Most of the information on mineral deficiency has been obtained through observation and experiments with animals, and only in recent years has medical science become intensively interested in deficiency diseases in animals and in men. In connection with our natural mineral water investigations it is a pleasure to note that recently the medical profession in general has become more interested in nutritional questions. Not only have the vitamins penetrated into the daily work of the practitioner but even the public has become conscious of them. Now what about mineral elements? We must not be astonished that but little is yet known about them and the role they play in the metabolism of the human body. Especially the so-called trace or minor nutritional elements are not even recognized or estimated by the physicians in spite of the great array of scientific publications in this field. It has always been taken for granted that the so-called impurities or minute traces of a great number of elements are always present in our food in sufficient amount, so why should one be excited about them if no one knows anything definite concerning their importance to our well-being.

Let us not forget that the vitamins are present in our body only in minute amounts, like ergosterol on our skin, and they bring about miraculous biochemical actions.

The practitioner of today is conscious of the source of, say, vitamin C, which he prescribes for his patient's diet and knows that not all canned or even fresh fruits contain a sufficient amount of this important vitamin. He knows that fresh potato juice under certain circumstances may contain much more vitamin C than orange juice which has been standing in the open air for several hours. The same practitioner, however, will not be concerned with the question of whether the vegetable he prescribes for his patient was grown on "healthy" soil which contains sufficient amounts of iron, copper and cobalt. This correlation between soil and vegetable or soil, grass, grazing animal and food or diet which he prescribes for his patient is still foreign to his thinking. It will take only a short time before nutritional mineral elements will be treated like vitamins and the practitioner will become familiar with them. Mineral elements are "inorganic vitamins," a now occasionally used term which I introduced seventeen years ago.[5]

2. Fischer, Hans, and von Seemann, Carl: Die Konstitution des Spirographis Hämins: XXXVII. Zur Konstitution der Porphyrine, Ztschr. f. physiol. Chem. **242**: 133, 1936.

3. One microgram or 1 gamma equals one millionth of a gram.

4. Maynard, L. A.: Relation of Soil and Plant Deficiences and of Toxic Constituents in Soils to Animal Nutrition, in Luck, J. M., and Smith, J. H.: Annual Review of Biochemistry, Stanford University, Calif., Annual Reviews, Inc., 1941, vol. 10, p. 449.

5. Baudisch, Oskar, and Welo, Lars A.: Chemische und physikalische Studien zum Mineral insbesondere zum Eisenstoffwechsel, Naturwissenschaften **13**: 749, 1925.

Perhaps it would be still impossible to speak so boldly about minor nutritional elements and their paramount importance in life processes if the results from the Australian research on cobalt were not known.[6] That the minor nutritional elements have to be taken seriously was excellently demonstrated in this classic research which I like to call "the story of cobalt." Since the research on cobalt has stimulated research on trace elements enormously, I want to relate the story in more detail.

As far back as 1807 it was known that grazing animals, especially sheep in the southern part of Scotland, suffered a disease referred to as "pining." A recognized cure was to shift the sheep to a more succulent herbage or pasture grown on limed soils. A similar disease was observed in New Zealand which was called "bush sickness" or Tauranga disease. The loss of animals through this sickness became so serious that as late as 1895 the Australian government started scientific research to find the cause of the disorder. In 1900 Gilruth[7] stated that in localities where the disease occurred there were "healthy" and "unhealthy" lands and that vegetation grew as luxuriously on one as on the other. It was further observed that the symptoms of the disease were similar to symptoms generally found in nutritional anemia. This finding naturally pointed to a possible deficiency of iron, but experiments did not satisfy the investigators. Anyhow, it was found that massive doses of iron were often helpful but not always. It seemed that some unknown substance was present in some of the limonite used as manure and not in the other. The Australian government started shipping iron ores from different parts of the world and used it on different acres of the "unhealthy" land. It thus was possible to select the iron mineral or limonite which gives the best results in preventing "bush sickness." The iron mineral which was found to be the most helpful in preventing the disease was now subjected to an analytical fractionation on a large scale, which one could compare with the fractionation of uranium ores or pitchblende by the Curies, in order to concentrate radium. The costly and tedious work finally led to the assumption that cobalt was the lacking element. The iron minerals or limonites which did not remedy the "bush disease" were extremely low in cobalt, while the limonite which prevented the trouble contained comparatively larger amounts of this metal. It was further found that the soils in bush sick areas contained only a trace of cobalt as compared with the healthful areas. Finally, in 1937 Kidson,[8] in a paper entitled "Cobalt Status of New Zealand Soils," reported that "soil affected with 'bush sickness' and allied stock ailments has comparatively low cobalt content, often less than 2 parts per million of cobalt." The unhealthy soil can be corrected by adding sufficient amounts of cobalt.

Sheep and cattle which are deficient in cobalt show symptoms of anemia, cachexia, loss in appetite and changes in muscles, liver and spleen. They recover if minimal amounts of cobalt are added to the forage (0.03 to 0.1 mg. with the sheep and 1.3 to 1 mg. with the cattle daily).[9] The liver which is free of cobalt in the sick animal stores cobalt in the animal receiving daily doses of this element.[10] It is amazing how infinitesimally small are the amounts of cobalt needed in comparison to iron, manganese, copper and zinc, where at least a hundred times this amount is demanded. According to Askew,[10] the sheep needs 0.04 mg. of cobalt daily. It is of special importance to know that the amount of cobalt necessary for mammals is so low that even spectrographic methods were not sensitive enough to detect amounts of cobalt in grass or fodder that are sufficient to heal the "bush sickness." Sufficient cobalt could be found in the "healthy" soil and in the liver and spleen of the healthy sheep but not in the grass which the animal must eat in order to get the necessary cobalt. Our methods for the determination and concentration of cobalt with organic reagents have been so improved that cobalt can be detected in grass. We have a similar example in sea water. Despite the fact that cobalt has not yet been found in sea water, it exists in certain sea animals (Pleuro branchus plumula—Webb[11]) in relatively large amounts. Thus cobalt must have been enriched by life processes. From these examples we can realize the vital importance of elements which are present only in infinitesimal amounts and cannot be detected by spectroscopic methods, which were always considered the most sensitive ones. Organic reagents like o-nitrosophenol[12] possess a chemical grouping which has a powerful selecting force to link cobalt in a ring structure and hold it. Thus the metal can be enriched and extracted in sufficient amount to be determined either by spectroscopic or by colorimetric methods.[13]

WHAT IS THE ACTUAL MECHANISM OF THE BIOLOGIC FUNCTION OF TRACE METALS?

The question "What is the actual mechanism of the biologic function of the trace metals?" is a bold one indeed and difficult to approach. We always fail wherever a real explanation of molecular mechanism is wanted. We know much about the biologic functions of vitamins. An adequate explanation of the actual mechanism in life processes, however, is unknown. Vitamins and trace metals like cobalt are functionally similar in certain respects, as both must be present in the right amount in order to be beneficial. A soil with an excess of cobalt becomes again an unhealthy soil. Just a small excess of cobalt above the normal in blood in rats causes polycythemia, a severe blood disease.[14] What must we really investigate in order to find out about the magic force and functions of trace elements and how can we approach this difficult problem? It seems to me that the metal proteids are the keys with which we can enter this obscure realm of science and learn about the mysterious forces which are hidden in the metals or elements. Since the portal of the

6. Beeson, Kenneth C.: Literature on Cobalt in Soil and Its Connection with Deficiency Diseases in Animals, Miscellaneous Publication 369, United States Department of Agriculture, 1941.

7. Gilruth, T. A.: "Bush" or Tauranga Diseases in Cattle and Sheep, Annual Report no. 8, New Zealand Department of Agriculture, p. 187, 1900.

8. Kidson, E. B.: Cobalt Status on New Zealand Soils, New Zealand J. Sc. Technol. **18**: 694, 1937.

9. Neal, W. M., and Ahman, C. F.: The Essentiality of Cobalt in Bovine Nutrition, J. Dairy Sc. **20**: 406, 1937.

10. Askew, N. O., and others: Literature from 1933 to 1938, New Zealand J. Sc. & Technol., vols. 15 to 20.

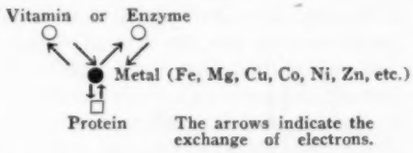
11. Webb, D. A.: Studies on the Ultimate Composition of Biological Material, Sc. Roy. Dublin Soc. **21**: 487, 1937.

12. Baudisch, Oskar: A New Chemical Reaction with the Nitrosyl Radical NOH, Science **92**: 336 (Oct. 11) 1940; Preparation of o-Nitrosophenol from Benzene and Other Aromatic Hydrocarbons at Room Temperature, J. Am. Chem. Soc. **63**: 622, 1941.

13. Baudisch, Oskar, and Heggen, George: Quantitative Colorimetric Determination of Iron in Biological Material, Arch. Biochem. **1**: 239 (Dec.) 1942. Cronheim, G.: Orthonitrosophenol as a New Reagent in Colorimetric Analysis, Indust. & Engin. Chem. **14**: 445, 1942.

14. Myers, V. C.; Beard, H. H., and Barnes, B. O.: Studies in the Nutritional Anemia of the Rat: IV. The Production of Hemoglobinemia and Polycythemia in Normal Animals by Means of Inorganic Elements, J. Biol. Chem. **99**: 465, 1931.

atom was opened by Rutherford and Bohr, we now can more and more explain chemical or biologic reactions by subatomic forces, i. e. the electrons which build up the atoms. Roughly speaking, the metal exchanges electrons with an added protein molecule of a specific nature and with an added vitamin or enzyme. The following scheme explains the idea:



None of the schemes of chemical reactions provide a reasonable explanation of why these trace elements or ions in vivo can do much more than ordinary ions in the test tube.

For instance, an ordinary iron ion decomposes only two molecules of hydrogen peroxide into water and oxygen, whereas under the same circumstances the same amount of iron also in its ionic form, but inserted in a peculiar four nitrogen framework, as present in the enzyme catalase, decomposes millions of hydrogen peroxide molecules. Hardly a more striking example could be given to demonstrate that nature has it in its power to link metallic ions chemically in such a way that they receive tremendously greater power than the iron ion in catalase.[15] It seems to be the type of bonding of the metal with its addenda (vitamins, enzymes, proteins) which determines the function of these combinations in life processes. Catalase, hemoglobin, chlorophyll and certain enzymes must serve us as models for further investigation in this line, because we have definite knowledge as to the constitution of their active derivatives. It is known that reactions between inorganic and organic substances in animals and plants take place with great velocity. The cause of the great velocity of reaction in living cells is found in the great variety of specifically acting catalysers, the so-called enzymes present in the cell. Without enzymes there can be no life. As soon as conditions become unfavorable for enzymatic activity, the vital processes are either greatly inhibited or stopped altogether. Enzymes in living cells represent an exceptionally complete and, one may say, "rational apparatus" for the acceleration of chemical interaction between organic substances.

Under certain circumstances the plain metallic ion itself can react as a prosthetic group. Kubowitz[16] has purified an enzyme which oxidizes polyphenols (polyphenoloxidases) to quinones. Phenol oxidases are of greatest importance in the living cell. Epinephrine action, tyrosinase, as well as ascorbino-oxyhydrase (vitamin C) belong in this category of enzymes.

Kubowitz has shown that these special enzymes are copper proteids. He furthermore showed by ingenious arrangement that copper is the prosthetic group of this enzyme. The copper enzyme was dialyzed against a dilute solution of cyanide which trapped the copper; the enzyme inactivated by this procedure was immediately reactivated by small amounts of copper ions.

The heavy metals presumably act in most metal-enzyme reactions as electron transfer systems, alternating between cuprous and cupric or ferrous and ferric states, but there are still other qualities developed in the combination of metals with organic substances which are of significance in life processes.

Let us mention some other metals which form a part of a combination of organic substances with enzyme-like action:

Manganese is a constituent of the enzyme arginase, which splits arginine into ornithin plus urea.[17]

Zinc is a part of the enzyme carboanhydrase which accelerates the velocity of the reversible reaction $HCO_3 \rightleftarrows CO_2 + OH$ more than a million times.[18] Carboanhydrase plays a most important part in the lungs and in other organs.

Aluminum is a constituent of the complex succinoxidase system which plays an important part in sugar metabolism. In this enzyme chromium and aluminum are interchangeable.[19]

Magnesium is a constituent of the enzyme phosphatase, which plays an important part in phosphate metabolism.[20] Carboxilase, an enzyme which splits keto acids, contains magnesium. It is composed of a co-enzyme (thiamine pyrophosphate, vitamin B_1 pyrophosphate) and magnesium.[21] Magnesium possesses some specific and unique character in the animal organism. The living organism undergoes fundamental changes if deprived of this vital element.

Iron is in the enzyme cytochromoxidase (respiration ferment of Warburg[22]), which is composed of a specific protein plus a specific hem compound, plus ferric iron atom.

The examples demonstrate clearly that metallic ions are directly associated with most vital life processes where vitamins or enzymes come into play. Not only are the metals an essential part of the structure of enzymes and vitamins but they seem to form the center of the whole enzyme structure similar to the center metal atoms or ions in the so-called Werner complexes.[23]

If we look back to the cobalt of which we had so much to say in the beginning, we should remember that Werner with a great number of co-workers synthesized hundreds of cobalt compounds in order to study the bonding of addenda to cobalt. In this study and in the fruits of the Werner theory in general lies the basis for the real explanation of the molecular mechanism of the trace metals in life processes. This is not the place to penetrate deeper into this difficult theoretical matter.

PHYSIOLOGICALLY IMPORTANT ELEMENTS AND THEIR PLACE IN THE PERIODIC SYSTEM

The periodic system built up on the fundamental basis of electron configuration must be considered the greatest triumph of all science. Not only our planet and all its inhabitants but the whole universe is built up of the ninety-odd elements presented in the periodic table. The chemical elements in our body are among those most common on our planet. We must assume that, before life could be created, masses of simple organic compounds had to be synthesized from the inorganic material which gradually was built up to more compli-

15. Sumner, T. B.; Dounce, A. L., and Frampton, V. L.: Catalase III, J. Biol. Chem. **136**: 343, 1940.
16. Kubowitz, F.: Ueber die chemische Zusammensetzung der Kartoffel Oxydase, Biochem. Ztschr. **292**: 221, 1937.
17. Richard, M. M., and Hellerman, L.: Activation of Enzymes: IV. Purified Liver Arginase-Reversible in Activation and Reactivation, J. Biol. Chem. **134**: 237, 1940.
18. Booth, V. H., and Roughton, F. T.: Catalytic Effect of Buffers on the Reaction $CO_2 + H_2O \rightleftarrows H_2CO_3$, J. Physiol. **92**: 36, 1938.
19. Potter, V. R., and Schneider, W. C.: Studies on the Mechanism of Hydrogen Transport in Animal Tissues: Dilution Effect of the Succinoxidase System, J. Biol. Chem. **142**: 543, 1942.
20. Lohmann, K.: Ueber die Pyrophosphat Fraktion im Muskel, Naturwissenschaften **17**: 624, 1929.
21. Ostern, P.; Baranowski, T., and Terszakowec, F.: Phosphorylation of Adenosin by Yeast and This Process in Alcohol Fermentation, J. Physiol. Chem. **251**: 258, 1938.
22. Warburg, Otto, and Christian, Walter: Pyridin der Wasserstoff übertragende Bestandteil von Gährungsfermenten (Pyridinnukleotide), Biochem. Ztschr. **287**: 298, 1936.
23. Werner, A.: New Ideas in Inorganic Chemistry, New York, Longmans, Green & Co., 1911.

cated organic structures. The parent material must have been first of all water, carbon and nitrogen. The few elements which build up organic matter are:

H	C	N	O	P	S
1	6	7	8	15	16

(The numerals are the number of electrons or units of negative electricity.)

These few elements also form the lipoids by means of which the body or cell is separated from the outer world. The lipoids in combination with proteins form the "inner surface." It cannot be doubted that part of the secret of life is the immense internal surface of the cell.

small amounts in natural mineral waters of different origin. It cannot be doubted any more that natural healing waters which have a number of elements in solution extracted them from material which in geologic time went through life processes, either through plants or animal life or both. Elements usually found in traces in natural mineral waters are:

As	Sb	Bi	Sc	Sn	and	Pb
33	51	83	34	50		82

It is, however, questionable if these elements are vital for the healthy living cell of the human body. Some of them stimulate life processes in a remarkable way, and from the standpoint of mineral water research

NUMBER OF ELECTRONS IN SHELL

	THE REPRESENTATIVE ELEMENTS (Differentiating Electron in Outermost Shell)								THE RELATED METALS (Differentiating Electron in Second from Outermost Shell)										THE RARE EARTHS (Differentiating Electron in Third from Outermost Shell)				
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21-30	31	32
SHELL	1 H 1.008 K 1	2 He 4.002 K 2							(III B)	(IV B)	(V B)	(VI B)	(VII B)		VIII		(I B)	(II B)					
K																							
L	3 Li 6.94 K L 2-1	4 Be 9.02 K L 2-2	5 B 10.82 K L 2-3	6 C 12.00 K L 2-4	7 N 14.008 K L 2-5	8 O 16.000 K L 2-6	9 F 19.00 K L 2-7	10 Ne 20.183 K L 2-8															
M	11 Na 22.997 K L M 2-8-1	12 Mg 24.32 K L M 2-8-2	13 Al 26.97 K L M 2-8-3	14 Si 28.06 K L M 2-8-4	15 P 31.02 K L M 2-8-5	16 S 32.06 K L M 2-8-6	17 Cl 35.457 K L M 2-8-7	18 A 39.944 K L M 2-8-8	21 Sc 46.10 L M N 8-9-2	22 Ti 47.90 L M N 8-10-2	23 V 50.95 L M N 8-11-2	24 Cr 52.01 L M N 8-13-1	25 Mn 54.93 L M N 8-13-2	26 Fe 55.84 L M N 8-14-2	27 Co 58.94 L M N 8-15-2	28 Ni 58.69 L M N 8-16-2	29 Cu 63.57 L M N 8-18-1	30 Zn 65.38 L M N 8-18-2					
N	19 K 39.096 L M N 8-8-1	20 Ca 40.08 L M N 8-8-2	31 Ga 69.72 L M N 8-18-3	32 Ge 72.60 L M N 8-18-4	33 As 74.91 L M N 8-18-5	34 Se 78.96 L M N 8-18-6	35 Br 79.916 L M N 8-18-7	36 Kr 83.7 L M N 8-18-8	39 Yt 88.92 M N O 18-9-2	40 Zr 91.22 M N O 18-10-2	41 Cb 93.3 M N O 18-12-1	42 Mo 96.0 M N O 18-13-1	43 Ma 99 M N O 18-13-2	44 Ru 101.7 M N O 18-15-1	45 Rh 102.91 M N O 18-16-1	46 Pd 106.7 M N O 18-18-0	47 Ag 107.88 M N O 18-18-1	48 Cd 112.41 M N O 18-18-2	58 Ce 140.13 19-9-2	59 Pr 140.92 20-9-2	60-69	70 Yb 173.04 31-9-2	71 Lu 175 32-9-2
O	37 Rb 85.44 M N O 18-8-1	38 Sr 87.63 M N O 18-8-2	49 In 114.76 M N O 18-18-3	50 Sn 118.70 M N O 18-18-4	51 Sb 121.76 M N O 18-18-5	52 Te 127.61 M N O 18-18-6	53 I 126.92 M N O 18-18-7	54 Xe 131.3 M N O 18-18-8	57 La 138.92 N O P 18-9-2	72 Hf 178.6 N O P 32-10-2	73 Ta 181.4 N O P 32-11-2	74 W 184.0 N O P 32-12-2	75 Re 186.31 N O P 32-13-2	76 Os 191.5 N O P 32-14-2	77 Ir 193.1 N O P 32-15-2	78 Pt 195.23 N O P 32-16-2	79 Au 197.2 N O P 32-18-1	80 Hg 200.61 N O P 32-18-2					
P	55 Cs 132.91 N O P 18-8-1	56 Ba 137.36 N O P 18-8-2	81 Tl 204.39 N O P 32-18-3	82 Pb 207.22 N O P 32-18-4	83 Bi 209.0 N O P 32-18-5	84 Po 210 N O P 32-18-6	85 ? N O P 32-18-7	86 Rn 222 N O P 32-18-8	89 Ac 227 O P Q 18-9-2	90 Th 232.12 O P Q 18-10-2	91 Ux 235 O P Q 18-11-2	92 U 238.14 O P Q 18-12-2											
Q	87 ? O P Q 18-8-1	88 Ra 225.97 O P Q 18-8-2																					

An improved periodic table by W. F. Luder, J. Chem. Educ. **16:** 393 (Aug.) 1939.

Essential for any system of the cell is that it be an energy system.

The elements which govern the water balance in the body are:

Na	Mg	K	and	Ca
11	12	19		20

In close partnership with them are the elements

Li	Be	Rb	Sr	Cs	and perhaps	Ba
3	4	37	38	55		56

In what degree these elements are connected with water absorption and water excretion is not known. It is to be assumed that these highly hydrated metals remain in ionic salt form in the tissue fluid.

There are a number of other elements which seem to be important in life processes. All of them are found in arsenic [24] has always been a therapeutic agent. There are 63.8 micrograms of arsenic per hundred cubic centimeters in the human blood, which increases in pregnancy during the fifth and sixth month to 222 micrograms. Lead is a normal constituent of sea water and is always present in crustacea and mollusks. Tin has been found in the tongue. Also the following elements are necessary for life either in plants or in animals:

B	F	Al	Si	Cl	Br	I	Ga	Ge
5	9	13	14	17	35	53	31	32

Gallium and germanium are constant companions of aluminum and silica. Boron is of great importance in

24. Bertrand, G.: Sur l'existence de l'arsenic dans l'organisme, Compt. rend. Soc. de biol. **134:** 1434, 1902. Schwarz, L., and Deckert, W.: Studien zur Bearteilung von Arsenbefunden in Ausscheidungen und Hautanhängen, Arch. f. Hyg. **106:** 346, 1931.

plant life, especially in tobacco and buckwheat. There is but little known about its role in the human body. It is certain that boron plays a part in the calcium metabolism. Spiro,[25] for example, has shown that the boric acid (HBO_2) occurring in the mineral water of Baden (Switzerland) is easily reabsorbed. Because it is itself lipoid soluble and readily forms complexes, the physiologic behavior deserves special attention. The scientific studies of boron compounds in Saratoga water will doubtless improve the understanding of its therapeutic value and application. The presence of boron in human blood and milk has been demonstrated.[26]

The therapeutic importance of silica, SiO_2 or H_2SiO_3, in Saratoga mineral waters is not to be underestimated. One of the Saratoga springs, Red Spring, has been esteemed for many decades by the populace as an eyewash and as a skin beautifier. The cosmetic effect of this spring can be attributed to monosilicic acid, forming a film of colloidal H_2SiO_3 on the skin. The fact that the aqueous humor of the human eye contains silicon is perhaps more than just an interesting correlation. It it very notable that SiO_2 is absorbed by the mucous membrane of the respiratory passages during inhalation.[27] That the skin needs silica is an established fact. Fluorine [28] causes a general cachexia and mottled teeth. Not more than 1.5 parts per million is generally considered safe. The difference between 0.0 and 1.0 part per million of fluorine in the domestic water supply has been shown to be highly significant from the standpoint of the amount of dental decay in a community. While small amounts of fluorine prevent decay, larger amounts produce mottled teeth.

The vital importance of bromine, similar to iodine, in human life, and in the metabolism of mammals in general, is today an established fact. It is a normal constituent of the pituitary gland. There is about as much bromine in the pituitary gland as there is iodine in the thyroid gland. According to Moruzzi [29] and to Zondek and Bier,[30] bromine is enriched in the pituitary gland and plays here an important part in correlation with iodine in the thyroid. The human pituitary gland contains an average of 0.701 mg. of bromine per hundred cubic centimeters in fresh organs. Zondek and Bier found that the blood bromine is lowered to half its normal figure in cases of "depressive mania" psychosis. Bathing cures at the thermes of Bourbonne-les-bains, which contain rather large amounts of bromine but practically no iodine, bring about a calming and soothing effect. The patient falls into a state of euphoria, pain disappears and a deep sleep follows.

Iodine [31] is the classic trace element of whose value even the public has been conscious for many years. It is known that iodine deficiency is usually the cause of thyroid hyperplasia. The incidence of goiter has received a great deal of attention in the United States. Many investigations have been made of the iodine content of foods grown in goitrous regions and in goiter free regions. Goiter is quite prevalent in New Zealand. It has been found that New Zealand cow's milk from the goiter free regions contained three times as much iodine as did that from affected regions.[32] Saratoga water contains relatively large amounts of iodine, and drinking an 8 ounce glass of this water a day would be enough to prevent goiter. Drinking of natural mineral waters containing iodine, such as the waters of Bad Tölz or Salsomaggiore, increase the excretion of uric acid considerably.[33] Iodine in natural mineral waters is present solely in the form of iodide ions, which easily penetrate not only mucous membranes but also the skin. Most of the iodine waters also contain sodium chloride, like Saratoga Springs waters, which in addition to chlorine contain bicarbonate and bromine ions.

There exists today a wide knowledge concerning the biologic action of copper which I shall not describe in detail in this publication. From our point of view, however, it is important to state the fact that this metal has the greatest distribution as a constituent of natural mineral waters. It is present in small amounts in Saratoga mineral water, from 1 to 10 micrograms per liter. From the point of view of balneotherapy it is interesting to note that copper, like divalent iron, is absorbed by the skin. It has been proved experimentally that copper, like manganese, is stored in the liver. Boyden, Potter and Elvehjem [34] proved that rats which receive large quantities of copper in their food store a great deal of that copper in the liver. The value for liver copper rose to three hundred times the normal values, while values for the blood and spleen rose only to two to five times the normal. Lundegardh and Bergstrand,[35] who made extensive investigations concerning copper in the liver of man, found it difficult to make statements about the normal value in the liver. Gerlach,[36] who examined 7 healthy persons who died suddenly and ought, therefore, to have exhibited normal values, found figures which vary between 3 and 13 micrograms per gram of fresh weight with a mean figure of 7.5 micrograms, i. e. 7.5 mg. per kilogram.

Gerlach's as well as Lundegardh's and Bergstrand's investigations proved the strange circumstance that the mean copper values were increased in tuberculosis.

The values in secondary anemias have naturally been of great interest since Hart, Steenbock, Elvehjem, Waddell and others showed that copper is a necessary supplement to iron to render possible the utilization of hemoglobin. It might be imagined that under such conditions the copper in liver is influenced, in one direction or another, in secondary anemia. According to Lesné and Briskas [37] the copper content stands in inverse relation to the iron content, so that low iron values are accompanied by high copper values. Lundegardh and Bergstrand [35] find remarkably high values among 5 cases of viridans sepsis, in that 2 cases show values of 8.7 mg. per kilogram and 1 the enormous value of 135.5 mg. per kilogram, which is about twenty-five times the normal mean value. According to Lundegardh, Bergstrand and others, the fetal liver is on the whole richer in copper than that of adults. From the point of view of balneology it is of especial interest

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27. Kraut, H.: Ueber den Kieselsäuregehalt des menschlichen Blutes und seine Veränderung durch Kieselsäure Zufuhr, Ztschr. f. physiol. Chem. **194**: 81, 1931.

28. McClure, F. T. A.: A Review of Fluorine and Its Physiological Effects, Physiol. Rev. **13**: 277, 1933.

29. Moruzzi, Giovanni: Contributo allo studio del bromo negli organi, Ber. d. ges. Physiol. **107**: 183, 1938.

30. Zondek, Hermann, and Bier, Artur: Hypophyse und Schlaf, Klin. Wchnschr. **1**: 760, 1932.

31. Shohl, Alfred T.: Mineral Metabolism, New York, Reinhold Publishing Corporation, 1939, p. 233.

32. Hercus, Charles E.: Endemic Goiter in New Zealand and Its Relation to the Soil Iodine, J. Hyg. **24**: 321, 1925.

33. Cardin, A.: Arch. ital. sc. farmacol. **7**: 242, 1938.

34. Elvehjem, C. A.: The Biological Significance of Copper and Its Relation to Iron Metabolism, Physiol. Rev. **15**: 471, 1935.

35. Lundegardh, Henrik, and Bergstrand, Hilding: Spectral-Analytical Investigation into the Content of Mineral Substances in Liver, Nova acta regine Soc. sc. Uppsala **12**, No. 3, 1940.

36. Gerlach, W.: Untersuchungen über den Kupfergehalt menschlicher Organe, Virchows Arch. f. path. Anat. **294**: 171-197, 1934.

37. Lesné, E., and Briskas, S.: Contribution à l'étude du métabolisme du cuivre chez le nourrisson, Acta pædiat. **22**: 123, 1938.

that copper influences the endocrine system. For instance, the antagonism between copper and the thyroid hormones is very noticeable. Thyroxin becomes inactive or detoxidized by forming a stable complex compound with this metal.[38] The amount of copper in blood after thyroidectomy is lowered. It rises on addition of thyroxin.[39] In infectious rheumatism of the joints, the copper content of the blood is doubled. Heilmeyer [40] explains this as due to a mobilization of copper in order to neutralize the bacterial toxins. The proposed drinking "cures" by copper-containing springs in cases of infectious rheumatic diseases thus receive a remarkable motivation.

Many more of the "related metals" (see periodic table) are found in the human body. We find quite an array in Saratoga mineral water. The list of related metals found in biologic matter is given in the accompanying table.

Zinc is an element necessary for life. Experiments on rats have shown that zinc is necessary for normal growth. Its deficiency brings about disturbances of genital functions, nitrogen assimilation and normal hair growth. Falling out of hair and hair changes seem to be directly connected with the presence or absence of this element.[41] The daily amount of zinc necessary for man is larger than that of iron, copper or manganese. According to Howe, Elvehjem and Hart,[42] the daily requirement of zinc is 0.25 mg. per kilogram.

It is possible that zinc deficiency is quite frequent. Since many natural mineral waters, including Saratoga spring waters, contain small amounts of zinc, the drinking of such water might be of value and beneficial for certain diseases. Zinc has an antidiabetic reaction.[43] Sea water is remarkably rich in zinc, but its amount seems to fluctuate according to location and depth. In the Atlantic Ocean between 0.002 and 0.008 mg. per kilogram has been found. Some sea animals enrich zinc more than a thousand times in their bodies.[44] It is of significance that in the human liver there is 32 mg. of zinc but only 2 mg. of manganese and 5 mg. of copper.[35] Milk, which contains only the smallest traces of iron, copper and manganese, has as much zinc as 0.5 mg. per kilogram.[45] The relation of zinc to the genital spheres has often been demonstrated.[41] Zinc activates the hypoglycemic action of insulin.[46] It also activates the ferment carboxylase.[47] It is of great significance and in direct accordance with our discussion concerning bond type and physiologic action of mineral elements that in insulin zinc is in organic binding. Because of similar behavior of zinc toward amino acids it is assumed that the zinc in insulin is linked in a ring structure. The valences which link the zinc originate partly from carboxyl groupings and partly from amino groupings. Such a linkage is typical for so-called inner complex compounds (chelate binding), which play an important part in biochemistry. The saturation of insulin with zinc lies between 2.7 and 3.5 per cent.

Manganese is one of the first trace elements which has been found to be of value in plant life.[35] In recent years various investigators have demonstrated that manganese is essential for the health and well-being of the human and animal organism. It is obvious that the manganese originates from the soil, goes into the growing plant and from here enters the animal organism if the plants are nutrients. If the soil is deficient in manganese, the plants grown in such soil will suffer a manganese deficiency and the animals eating the plants may develop a deficiency disease. However, little is known about such diseases and about the specific biologic function of manganese in the human body. Orent and McCollum [48] found that manganese aids lactation and prevents degeneration and atrophy of the testes in the rat. In the chick it is effective in preventing the development of the bone condition known as perosis.[49] Manganese has been found to serve as an activator of certain enzymes, notably arginase, phosphoglucomutase and certain peptidases.[50]

Related Metals Found in Biologic Matter

Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn
22	23	24	25	26	27	28	29	30
	Mo						Ag	Cd
	42						47	48
	Wo							
	74							
	U							Hg
	92							80

Manganese, like other metals, is stored up in the liver, which is the organ most abundant in manganese. According to Reiman and Minot [51] the human liver contains from 1.2 to 3.51 mg. manganese per kilogram of fresh weight. The manganese values in the liver do not vary so much as those for iron and copper. However, remarkably low values are noted in cases of pneumonia.[35] The disease group in which the value appears to be raised is pulmonary tuberculosis. In contrast to copper and iron, manganese does not appear to be especially abundant in the newborn child, and the values lie considerably below those found for adults. The stored manganese rises in a very striking manner between the ages of 20 and 30 years and is very stable on a level which is about 50 per cent above that of the period of adolescence (19.8 mg. per kilogram). Children need about 0.2 to 0.3 mg. of

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50. Edlbacher, S., and Pinösch, H.: Ueber die Natur der Arginase, J. Physiol. Chem. **250**: 241, 1937. Edlbacher, S., and Baur, H.: Zur Kenntnis der Natur der Hefe- und Leberarginase, Naturwissenschaften **26**: 267, 1938.

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manganese per kilogram.[35] Recent experiments carried out by Greenberg and Campbell[52] with the radioactive isotope of manganese Mn^{57} (labeled manganese) have added much to our knowledge concerning the fate of manganese in the animal body. The experiments were carried out on rats on a normal control diet. Most of the manganese is excreted in the feces whether it is administered orally or by injection. This agrees with the finding of Skinner, Peterson and Steenbock,[53] who have reported that 80 to 99 per cent of orally fed manganese was excreted in the feces, depending on the amount ingested. When manganese was administered orally, 2.8 per cent of retained manganese was found in the liver, bone, muscle and blood, the liver showing the largest uptake. Little, if any, of the absorbed manganese is excreted in the urine. When the manganese was administered by injection, the retained manganese was found in the skin, bone, liver, muscle, small intestine and stomach, the skin and bone showing rather large amounts. Other tissues showed no significant amount. Muscle and skin, apparently, are important sites for the storage of manganese that is absorbed, especially as the tissues represent a large portion of the mass of the animal. Bone and liver also seem to be important in the storage of manganese. The manganese found in the liver may be an indication of its excretion into the bile, or it may be connected in some manner with the activation of certain enzymes found in the liver. Manganese is supposed to be the co-enzyme of a proteid which is important in synthesis. Rudra[54] has shown that manganese probably plays a part in the synthesis of ascorbic acid in the liver.

Concerning the effect of manganese on polycythemic animals, it has been found that manganese has some stabilizing influence on the increased hemoglobin, erythrocyte, cell volume and blood volume values characteristic of cobalt polycythemia[14] and acts in some way to alleviate the toxic condition resulting from the long-continued administration of small quantities of cobalt.

SUBSURFACE AND SEA WATER IN THERAPY

On account of the analytical composition of Saratoga Spa water and sea water, similar except for sulfates and phosphates, we are able to apply the results and experiences obtained from sea water drinking cures to drinking of natural mineral water, especially Saratoga waters. From earliest times ocean water as well as natural mineral waters similar to Saratoga water have been given by mouth with results that proved both beneficial and lasting. Both types of water are of true medicinal value and bring about a transmineralization of the living cells of the body. The mineral elements in our body, even in the bones of adults or in teeth of growing children, are constantly replaced by other or new ones. Our food and drinking water supply these minerals. It is one of the remarkable chapters in physiology that not long ago the so-called "ash" part of our body was considered more or less negligible. Today we know not only that each single mineral element plays its important part in life, but that the antagonism and synergism of the elements make life possible. The most obvious instance of biologic antagonism can be seen in the mutual relation of calcium and potassium (heart beat) and of calcium and magnesium (muscle activity). Calcium and iron stand in mutual relationship (anemia) and many more such cases could be demonstrated. The calcium necessary for heart beat and the bones is formed in a special Werner complex in combination with phosphorus and carbon dioxide.

Our whole skeleton is rebuilt continuously, and calcium is one of the important building materials which we have to furnish in sufficient amount. Calcium assimilation is only one small part of the whole complicated problem of transmineralization of the body by the internal use of mineral water.

In this connection it is a logical question, and one of the most far reaching in relation to our whole problem, to ask "What really happens if we transmineralize or change our natural salt solutions in the blood serum and in the cells?" In order to answer this question and all of its implications completely, it would be necessary to study analytically all the changes of all the different organ functions by variation of salt mixtures and concentrations, and we would have to tabulate up the results and study the new functions of all the different organs. In this way we could ultimately reach our goal of introducing a sound theory of mineral water therapy and of drinking "cures." We are far from this goal, but we know our problem and how to approach it.

In order to tackle this problem from its basis, we must know how single cells behave toward surrounding salt solutions and then extend our knowledge in order to be able to apply it to the cells of higher animals and of man.

In our special problem concerning trace elements, we must confess that we are still far behind in being able to make concrete statements. We are not yet certain in the contention that the healing action of the waters should be ascribed mainly to the elements present only in minute amounts, but we do know that these elements are certainly of additional therapeutic value. The problem is most complex. We must ask the question as to how these substances act on the human body in sickness and in health, and what part they play in the vital processes. We must consider that the substances in mineral waters which act on the patient are almost all constituents of the human body and are replaced continuously. Our knowledge concerning deficiency of certain elements in the human body is today mainly focused on iron and iodine. Natural mineral waters of the Saratoga type are certainly healing waters in cases where these elements are deficient in the body. From all I have said here we see there can be no doubt that all the small amounts of numerous elements present in sea water or in the soil must have entered the life process genetically and become essential parts of living substances. Such knowledge alone should be helpful in making natural mineral waters at least interesting to the physicians and the biologists and rouse their attention in a scientific manner. If nature puts so much stress in her inventive power on linking metal ions into the organic structure of living matter, they certainly must be of paramount importance for life in general. The metal proteids in vitamin and enzyme systems are only one small group which proves this statement. The study of trace elements has already raised natural mineral water therapeutics to a high level of importance. It has made research on natural mineral waters rank equal with that on vitamins and enzymes, and shown the necessity of integrating the two fields.

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Council on Foods and Nutrition

THE COUNCIL HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORT.

GEORGE K. ANDERSON, M.D., Secretary.

MINERAL OIL (LIQUID PETROLATUM) IN FOODS

Ever since the reports of Dutcher and his collaborators [1] and of Burrows and Farr [2] in 1927 it has been known that liquid petrolatum (mineral oil) interferes with the absorption of carotene. Several years ago the Council, as a result of considerations of a salad dressing containing mineral oil, which was designed for convenience in the formulation of therapeutic diets low in fat, called attention to the evidence then available about this possible deleterious effect and concluded that salad dressings containing mineral oil should be used only under the direction of a competent physician.[3] Since that time the situation has changed. The use of mineral oil in foods has increased, and much of the mineral oil so used is being taken without proper medical advice and often no doubt without the knowledge of the person consuming the food. The evidence obtained from newer studies of the effects of the ingestion of mineral oil shows conclusively that the harmful potentialities of mineral oil are far greater than had been supposed. Because of these developments the Council decided to prepare the present brief account of the evidence now available, with the view to reaching a decision about the acceptability of food products containing mineral oil and to informing physicians and others of its views.

As long ago as 1914 the Council on Pharmacy and Chemistry [4] published a report on liquid petrolatum in which it was mentioned that the introduction of this laxative on a fairly extensive scale in medical practice occurred in the period around 1905 to 1910. Today self medication with mineral oil and other laxative drugs regrettably is common. Although constipation usually is a symptom of little significance, Logan [5] has pointed out that it caused more than half the patients with gastric cancer to seek advice at the Roosevelt Hospital in New York.

Mineral oil has been recommended for the cooking of foods. Potato chips prepared in mineral oil have been placed on the market, and the use of mineral oil in the frying of doughnuts has been suggested.

From reports that have come to the attention of the Council it is evident that the use of mineral oil in foods has increased considerably, especially in the form of imitation mayonnaise or salad dressing in which mineral oil replaces the usual food oils that one would expect to find in such preparations. Even when these products are labeled to declare the presence of mineral oil, it is obvious that the consumer has no opportunity to read the labels when they are affixed on gallon size containers and sold to restaurants and institutions. Federal and state authorities having jurisdiction over foods can take suitable action against food products introduced into commerce without proper labeling. However, even labeling showing the presence of mineral oil in salad dressings does not afford adequate protection to the consumer who has no opportunity to read the label or who is possessed of insufficient information to comprehend the significance of statements required by regulations.

There are a number of reasons why there has been an increased use of mineral oil as an ingredient of certain foods. Physically these products can be made so that they cannot be differentiated, except in a laboratory, from ordinary products containing true fats or oils. The mineral oil products do not become rancid, and they may be kept for long periods of time without refrigeration. Mineral oil provides no food value, and products containing it are sometimes referred to, especially on restaurant menus, as "nonfattening" or "slenderizing." They usually can be produced much more cheaply than foods containing animal or vegetable oils and, unlike ordinary food oils and fats, mineral oil is plentiful and requires no ration points. Is it any wonder that the use of mineral oil in foods has tended to increase alarmingly?

THE ALIMENTARY BEHAVIOR OF MINERAL OIL

Absorption.—In 1884 Randolph [6] studied the absorption of a preparation of petrolatum and showed that, within the limits of analytical error, it could be recovered quantitatively in the feces. Other workers later showed that liquid petrolatum is relatively nonabsorbable from the alimentary tract, whether the oil is of the paraffin hydrocarbon type obtained from Pennsylvania crude oils or is of the squalene and naphthene type produced from Russian or California crude oils. It was not until 1932 that it was reported by Channon and Collinson [7] that small traces of mineral oil could be absorbed by animals and deposited in the liver. Stryker [8] in 1941 made a thorough microscopic and chemical study of the absorption of liquid petrolatum by rabbits, white rats and guinea pigs. The amounts of mineral oil administered daily were large; for example, 20 or 30 cc. to rabbits for several months. Gross examination of the bodies of the experimental animals after they had been killed showed white nodules in the intestine of the rabbits, involvement of the mesenteric lymph nodes of the rats with yellow flecks in the liver, and no demonstrable lesions in the guinea pigs. Microscopic examinations revealed the presence of oleophages in certain cells, usually in the superficial lamina propria near the tips of the villi, but occasionally deeper in the cells and, in all three species of animals, both intracellular and extracellular vacuoles in the mesenteric lymph nodes. Animals fed mineral oil for a considerable length of time showed pathologic changes in the liver consisting of vacuolated cells and extracellular vacuoles. Examinations of the mesenteric lymph nodes of selected human autopsy material revealed the same type of vacuoles, which did not reduce osmic acid and stained yellow by the Carminati method. From the mesenteric lymph nodes of both human beings and experimental animals an unsaponifiable oil could be obtained which did not absorb hydrogen and which had an index of refraction and specific gravity of liquid petrolatum. Frazer, Stewart and Schulman [9] in 1942 reported that considerable absorption of liquid petrolatum from the intestine can occur if the oil is emulsified. When the droplets of oil were approximately 0.5 micron in diameter they could be observed in the cells of the intestinal wall of the rat. By means of the chylomicrographic method it was possible to demonstrate oily particles in the blood. Absorption was as high as 60 per cent, which these authors point out compares favorably with the absorption of olive oil when similarly tested.

The evidence thus is conclusive that liquid petrolatum can be absorbed in small amounts from the intestine. Further study is needed of the extent and significance of lesions of the liver and other organs that may be produced by long continued ingestion of mineral oil. It appears, however, that there is no real basis for any belief that mineral oil has any carcinogenic effect.

Effect on Carotene and Vitamin A.—As a result of a great deal of investigation, especially by Curtis and his collaborators,[10] there now has been obtained a quantitative appreciation of the influence of mineral oil on the absorption of carotene. Curtis [11] has calculated that each ounce of mineral oil at body temperature is able to dissolve 140,000 international units of carotene and, at room temperature, 120,000 international units. The magnitude of these figures explains the profound effect exerted by mineral oil, and the difference in the solubility at

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11. Curtis, A. C.: The Mineral Oil Vitamin A Problem, Virginia M. Monthly **69:** 235 (May) 1942.

body and room temperatures explains the experimental observation that mineral oil continues to exert its deleterious effect even when it has been saturated at room temperature with carotene. The diet ordinarily provides each day from 5,000 to 10,000 international units of vitamin A and, with the normal choice of foods in the United States, about two thirds of the total is contributed by the carotene of plant foods. Animal food sources of vitamin A are relatively few, being restricted to milk and other dairy products containing butterfat, egg yolk, beef fat, liver and fish liver oils. Helen S. Mitchell[12] reported about ten years ago that rats need from ten to twelve times more spinach to supply their vitamin A requirement when the spinach is fed with 0.5 cc. of mineral oil, and eight times as much when the mineral oil and the food are fed six hours apart. Observations such as these emphasize the undesirability of incorporating mineral oil in foods.[13]

Although liquid petrolatum has a profound adverse effect on the absorption of carotene, its effect on vitamin A itself is much less because vitamin A has a lower solubility in mineral oil than carotene. For this reason Curtis[11] has suggested that, whenever mineral oil is the cathartic of choice and is to be used for any period of time longer than a month, there should be administered with it 1 or 2 teaspoons of cod liver oil or its equivalent of other fish liver oil. "This is like borrowing from Peter to pay Paul," he has written, "but nevertheless it answers the problem of carotene loss to mineral oil." But vitamin A is not the only dietary essential whose assimilation may be adversely affected by the ingestion of mineral oil, and taking cod liver oil with mineral oil or saturating mineral oil with some form of vitamin A may actually lead to a false sense of security.

Constipation frequently occurs in pregnant women and in persons on restricted diets, and these are the very people who, because of the difficulty of meeting their dietary requirements with foods, should use mineral oil as a laxative understandingly or not at all. Hirst and Shoemaker[14] concluded as a result of their observations on 328 pregnant women under good antepartum dietetic management that "dietetic insufficiency in pregnancy should be assumed, and artificial vitamin A supplement offered in all cases." Some indication of the frequency with which mineral oil is used in conjunction with therapeutic diets is provided in the reports of cooperative investigations of the American Dietetic Association. Thus Johnson[15] has written that mineral oil was used in five of fifteen of the 1,500 calory diets reported, in eleven of twenty-six of the 1,200 calory diets and in six of twenty-one and six of thirty-eight of the 800 calory and the low fat diets, respectively. These reports of diets were obtained from thirty-six hospitals in widely separated sections of the United States. While the vitamin A values for all these diets were considered satisfactory, if mineral oil was not consumed, it was emphasized that nearly all of the vitamin A was due to carotene, and the actual vitamin A content of the diets was extremely low unless 3 ounces or more of liver was included in the diets at least once a week.

Vitamin D, Calcium and Phosphorus.—In 1940 Smith and Spector[16] reported their studies on the effect of the ingestion of mineral oil on the utilization of vitamin D. Even though the vitamin D was fed separately as cod liver oil, it was found that three times as much was needed to heal rickets in rats when the basal diet contained 5 per cent mineral oil. When the basal ration contained 10 per cent of mineral oil from five to ten times more cod liver oil was needed to heal rickets. These investigators also demonstrated with growing puppies that the ingestion of mineral oil interferes with the retention of calcium and phosphorus. It was found also that puppies reared on a diet which contained 10 per cent of mineral oil with adequate amounts of calcium and phosphorus did not show normal calcification of the bones even when the amount of cod liver oil administered was increased as much as fivefold.

Vitamin K.—The effect of mineral oil on vitamin K was studied by Elliott, Isaacs and Ivy.[17] A large number of rats were fed on a stock ration to which had been added 20 per cent of mineral oil by weight. Prothrombin deficiency, as measured by the Quick prothrombin time method, developed in the blood, and the condition was cured by the subcutaneous administration of a vitamin K preparation. It was the opinion of these investigators that the mineral oil interfered with the absorption of vitamin K. Hepatic injury was not ruled out but was considered to be unlikely.

The foregoing observations of Ivy and his collaborators received support and elaboration from the studies of Javert and Macri.[18] While investigating the prothrombin concentration during normal pregnancy they found in one woman a lowering of the prothrombin values below normal, and this condition was not improved by the administration orally of a vitamin K preparation. Intramuscular injections were effective. It was learned that this woman had been taking mineral oil during the course of her pregnancy. When the mineral oil was discontinued while the administration of vitamin K was continued, the prothrombin values increased to normal. However, at parturition the prothrombin of the cord blood was only one-third normal despite the administration of large amounts of vitamin K to the mother. Detailed studies then were made of 9 women who were found to be taking mineral oil intermittently during pregnancy. Of these women 3 had low prothrombin values. Of 10 other pregnant women taking mineral oil daily, 7 were found to have hypoprothrombinemia. The authors believed that the mineral oil produced its effect either through adsorption or the prevention of absorption of the vitamin K, or possibly through interference with bacterial synthesis. Their observation that the oral administration of vitamin K may be of little or no value if mineral oil also is being given is worthy of emphasis and serious thought.

MEDICAL OPINION REGARDING MINERAL OIL

Conflicting views are recorded regarding the effect of mineral oil per se on the alimentary tract. Many physicians consider mineral oil preparations the laxative of choice. It is probable that under medical supervision mineral oil can be properly used, but the ease of obtaining the preparations as well as other laxative drugs readily leads to abuse. Proctologists have experienced difficulty in visualizing the wall of the rectum because of an adhering film of oil in persons who take liquid petrolatum. The seepage of mineral oil is well known to be one of the discomforts that may attend the use of this substance. Morgan[19] has written forcefully about the need of caution in the use of liquid petrolatum. He has mentioned a syndrome to which he has ascribed the term "mineral oil poisoning" which may result from the continual oral administration of liquid petrolatum and which is relieved by discontinuance of the oil together with supportive measures to overcome the weakness which accompanies this syndrome. The most frequent signs and symptoms are anorexia, indigestion, flatulence, fatigue, nervousness, dyschesia and anal leakage, accompanied in many cases by considerable loss of weight. On the basis of reports such as these there can be no justification for the incorporation of liquid petrolatum in foods.

CONCLUSIONS

It has been shown that the ingestion of liquid petrolatum is capable of interfering seriously with the absorption of carotene, vitamin D, calcium and phosphorus and vitamin K. The effects

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of its prolonged use have not been thoroughly investigated, but there is sufficient evidence of possible harmful effects to justify the conclusion that its indiscriminate use in foods or in cooking is not in the interests of good nutrition, and any such use should be under careful supervision of a physician.

The Council previously has accepted, with a special requirement that the products be promoted for use only under the direction of a physician, salad dressing or imitation mayonnaise containing mineral oil, for use in therapeutic diets. In view of the abuses which have developed through the production and sale of food products containing mineral oil to the public, the impracticability of providing suitable and adequate warning of the possible harmfulness of such preparations, and the fact that physicians wishing patients to use such products readily can supply directions for their preparation on a small scale from liquid petrolatum and other ingredients, the Council has voted, on the basis of the evidence reviewed in the present report, to withdraw its acceptance of these products.

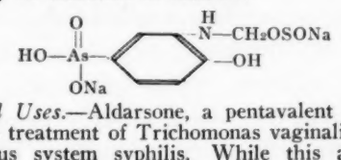
Council on Pharmacy and Chemistry

NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

AUSTIN E. SMITH, M.D., Secretary.

ALDARSONE.—Aldarsone consists chiefly of the sodium salt of the pentavalent arsenical compound 3-N-methanal sulfoxylic acid-amino-4-hydroxy phenylarsonic acid, admixed with minor amounts of sodium chloride and sodium bicarbonate incidental to its manufacture. It contains from 17.0 to 18.5 per cent of arsenic. The probable structural formula of the arsenical compound may be indicated as follows:



Actions and Uses.—Aldarsone, a pentavalent arsenical, may be used in the treatment of Trichomonas vaginalis vaginitis and central nervous system syphilis. While this agent probably possesses comparatively low toxic properties, because of its arsenical nature the physician should be on guard against untoward reactions. Such reactions include dermal and hemopoietic changes, nitritoid reactions. Since aldarsone is a pentavalent arsenic compound, every care should be exercised and visual and color field examinations made prior to drug therapy so that contraction of visual field or symptoms of blurring may be observed.

Dosage.—For the treatment of central nervous system syphilis: 1 Gm. of aldarsone dissolved in 10 cc. of sterile distilled water, administered intravenously once a week. The injections may be given continuously for periods of forty to fifty weeks. Concurrent bismuth therapy may be employed during a portion of the course of aldarsone injection. Aldarsone may be given as a supplement to fever therapy in the treatment of various forms of central nervous system syphilis.

For the treatment of Trichomonas vaginalis, aldarsone may be administered by insufflation of the powder (with kaolin) and in the form of a suppository. For insufflation the vaginal tract and external os of the cervix are thoroughly cleansed and dried; then the contents of a 3 Gm. vial of aldarsone with kaolin are introduced by an insufflator. A cautionary statement is issued on the use of positive pressure in the pregnant female when insufflation is employed. The escape of air from the vagina should be permitted during compressions in case the patient is pregnant. The patient is treated for three consecutive days. Then additional treatments are given at three day intervals. No douche should be taken during the treatment.

Aldarsone suppositories may be used in conjunction with insufflation. They offer a way of providing aldarsone between insufflation treatments. Suppository treatment is started no sooner than twenty-four hours after the last powder treatment. One is inserted every second or third night until the patient reports for the next insufflation treatment. They may also be used alone by insertion of one suppository every third or fourth night for not more than three weeks. The patient should be warned against prolonged use of this treatment without the advice of a physician, since an arsenical is being employed. Suppositories alone should not be expected to produce permanent results: merely to lessen the discharge and diminish symptoms.

Tests and Standards.—

Aldarsone occurs as a white, odorless, amorphous powder. It is soluble in water, dilute acids, alkalis and alkali carbonates; slightly soluble in methyl alcohol and insoluble in ether and ethyl alcohol. The *pH* of a 5 per cent solution is from 7.0 to 7.4.

Add 0.2 Gm. of sodium hydrosulfite to about 0.1 Gm. of aldarsone dissolved in 5 cc. of water and warm at 50-60 C. for five minutes: a yellow solution is produced; add normal hydrochloric acid dropwise to the solution: a lemon-yellow gelatinous precipitate forms, soluble in excess hydrochloric acid. Add 1 cc. of iodine solution and 2 cc. of chloroform to 10 cc. of a 1 per cent solution of aldarsone; shake the test tube and contents and then allow the liquids to separate: no color appears in either of the liquid layers. Repeat the test, first adding 0.25 Gm. of sodium bicarbonate: no color appears in the chloroform layer, but the aqueous layer is colored light brown. Add 2 cc. of diluted nitric acid and 1 cc. of silver nitrate solution to 5 cc. of a 1 per cent solution of aldarsone: a black precipitate forms; heat to boiling and cool: the mixture rapidly changes to a yellow-brown solution containing a white precipitate; decant the solution: the precipitate is soluble in excess ammonia. Add 3 drops of alkaline potassium mercuric iodide solution to 5 cc. of a 1 per cent solution of aldarsone: a gray to black precipitate of metallic mercury is formed (*distinction from acetarsone, tryparsamide and other pentavalent arsenicals*).

Dissolve 0.1 Gm. of aldarsone in 5 cc. of water, add 0.5 cc. of 10 per cent sodium nitrite solution, cool in ice water and add 0.1 cc. of 10 per cent hydrochloric acid followed by 0.1 cc. of a solution containing 5 per cent betanaphthol and 10 per cent sodium hydroxide: no red color is produced on standing (*absence of 3-amino-4-hydroxyphenylarsonic acid*).

Dissolve 0.5 Gm. of aldarsone in 10 cc. of water, add 1 cc. of diluted ammonia water and 1 cc. of magnesia mixture: no precipitate forms (*absence of inorganic arsenate*). Heat the solution to boiling: a white precipitate forms slowly.

Dry an accurately weighed 1 Gm. portion of aldarsone contained in a weighing bottle not less than 20 mm. diameter over fresh phosphorus pentoxide for twenty-four hours in a vacuum of at least 5 mm. of mercury: the loss in weight is not more than 3.0 per cent. Transfer about 0.5 Gm. of aldarsone accurately weighed to a tared porcelain dish, add 0.5 cc. of sulfuric acid and gently ignite. Cool, treat the ash with 5 drops of sulfuric acid and 5 drops of hydrochloric acid. Evaporate the acids over a low flame and then ignite, cool and weigh: the weight of the sulfated residue is equivalent to a sodium content of not less than 15.2 per cent nor more than 16.2 per cent. The residue responds to tests for sodium.

Dissolve about 0.5 Gm. of aldarsone, accurately weighed, in 25 cc. of water; add 10 cc. of silver nitrate solution and 10 cc. of nitric acid. Warm on a steam bath for fifteen minutes and finally add 100 cc. of water. Continue the digestion on the steam bath for thirty minutes, cool, allow to stand thirty minutes and collect the precipitated silver chloride on a suitable tared sintered glass filter (or Gooch crucible). Wash the precipitate and dry at 100 C. for one hour: the weight of silver chloride found is equivalent to a chlorine content of not less than 6.5 per cent nor more than 7.5 per cent.

Dissolve about 0.5 Gm. of aldarsone in 10 cc. of water contained in a 400 cc. beaker and add a solution made by dissolving carefully 5 Gm. of sodium peroxide in 25 cc. of water. Cover the beaker with a watch glass and heat on a steam bath for one hour. Cool, add hydrochloric acid down the side of the beaker with stirring until the solution is colorless and then add 1 cc. in excess. Add 25 cc. of water and boil the solution gently, covering the beaker with a watch glass until the volume is reduced by one half. Dilute to approximately 300 cc. with water, boil and add 15 cc. of barium chloride solution dropwise at first until a precipitate forms. Digest the mixture for one hour on the steam bath and filter while hot, collecting the precipitated barium sulfate on a suitable tared, previously ignited, Gooch crucible. Wash the precipitate with hot water until chlorides are absent from the washings. Dry the crucible and contents at 100 C. for fifteen minutes and finally ignite at 650 C. for fifteen minutes: the weight of barium sulfate formed is equivalent to a sulfur content of not less than 6.5 per cent nor more than 7.5 per cent.

Transfer about 0.5 Gm. of aldarsone, accurately weighed, to a 250 cc. wide mouthed Erlenmeyer flask, add 10 cc. of water to dissolve the sample taken and then add 15 cc. of 30 per cent hydrogen peroxide. Mix and add 10 cc. of sulfuric acid slowly down the side of the flask, shaking the mixture after each addition. Place a short stemmed funnel in the top of the flask and heat at medium temperature until the reaction subsides. Remove the funnel and heat for twenty minutes at a temperature such as to produce sulfur trioxide fumes freely. (If at the end of five minutes the solution is not colorless, cool and add from 2 to 5 cc. of 30 per cent hydrogen peroxide, then continue to heat as before.) Cool and add through a long stemmed funnel 0.2 Gm. of hydrazine sulfate (*chlorine free*). (*Care should be taken to prevent adherence of hydrazine sulfate to the wall of the flask*). Heat the acid solution to dissolve any crystals of hydrazine sulfate and then maintain heat sufficient to produce fumes of sulfur trioxide, which show a partial condensation point about 2 inches from the top of the flask, for twenty minutes. Cool, dilute (*carefully*) with 20 cc. of distilled water, add from 3 to 5 drops of a methyl orange solution (3 cc. of methyl orange test solution diluted to 100 cc. with water) and titrate while hot with tenth-normal potassium bromate solution until the solution becomes colorless. Near the end point the potassium bromate solution should be added dropwise. Each 1 cc. of tenth-normal potassium bromate is equivalent to 0.003746 Gm. of arsenic: the amount of arsenic found is not less than 17.0 per cent nor more than 18.5 per cent.

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SATURDAY, DECEMBER 11, 1943

GEOGRAPHY AND THE ETIOLOGY OF CANCER

Geographic differences in the total incidence and in the types of cancer are gradually becoming more and more apparent. The factors which cause cancer can be divided into those that are hereditary and those that are environmental. Research would be simplified if one group could be ignored and all efforts concentrated on the other, or if they could be separated. In a previous editorial [1] the point was made that while a hereditary factor is accepted as etiologically important in a few uncommon types of tumors its role, if any, is not known in the major, common types of cancer in man.

Studies on the geographic distribution of the total incidence and of the types of cancer can under certain conditions separate the hereditary from environmental factors and help decide their relative importance. The role of hereditary factors can be determined by the study of races, especially pure races, by comparing them with one another and also by studying a relatively pure race under different environments. The environmental factors can be evaluated by studies of a race under different environmental conditions. These include dietary and social customs, climate, sunshine, temperature, altitude and other factors.

The relationships of geography and race to cancer are especially intriguing. If real geographic differences in cancer are found to exist, they must be due to either hereditary or environmental factors. If, in the same environment, different races show different incidences and types of cancer, then hereditary influences are probably operating. If further geographic comparisons reveal that the same racial group living in different environments has different amounts and kinds of cancer, then the etiologic factors must be environmental. If the tumor incidence of races after migration remains the same as that in the homeland, despite changes in the environment, then hereditary explanation must be sought.

The incidence of cancer in all parts of the world should be studied. In each locality the incidence should be determined separately for each racial group. The incidence of tumors in members of races which have migrated into dissimilar environments could then be compared with one another and with that of the mother country. The tumor incidence of races that have migrated but retained their traditional dietary and other customs could be compared with other emigrants of the same race who have adopted new customs.

Thus it is important to know the tumor incidence of Europeans, Asiatics, Africans, Americans and peoples of the islands not only in their normal localities but also after migration to other parts of the world. How does cancer in Chinese living in China compare with that of Chinese living in San Francisco and Singapore? Do Germans in Brazil have the same amount and types of cancer as Germans in Germany or Milwaukee? What happens to the incidence of cancer when the African Negro migrates to the West Indies, New Orleans and Harlem?

Fortunately a source of information exists which, up to now, has been almost untapped. Scattered over the world are first class medical schools. Each of them has a department of pathology which through its members supplies expert pathologic services to affiliated teaching hospitals. Since these are hospitals giving general instruction to medical students they usually accommodate all types of disease. Thus they tend to represent a fairly accurate cross section of the diseases in that locality. The accuracy of diagnosis of the common types of tumors at necropsy is approximately the same in these various medical centers. The principal differences in their necropsy populations are in their racial origins and in some environmental factors. Other differences exist, such as average age, sex ratio, social background and selective concentrations of certain diseases due to the special interests of the clinical staffs, but these can be recognized and subjected to correction factors. Here then lies a great wealth of data already accumulated but unreported or easily obtainable.

Other sources of data which could be used for the solution of the same problems are the necropsy records of nonteaching hospitals with large pathologic services, departments of surgical pathology and the vital statistics. Probably none of these have the same degree of uniformity and reliability over the world as is possessed by the former. For the solution of some problems, however, they are adequate and even superior.

Scientists over the world should report their data. When this is done, all peculiarities of the hospital and

1. Heredity of Cancer in Man, editorial, J. A. M. A. **122**: 677 (July 3) 1943.

necropsy population should be stated. The total cancer mortality should be given as well as the relative proportions of the different kinds of cancer. The social background, age, sex, racial origins and other factors should be included. A statement should be made as to how well the necropsy population represents the composition of the population as a whole. If successful treatment has reduced the necropsy incidence of some types of tumors materially, this should be stated. These and other data should be given so that they can be compared with those from other parts of the world.

From the vantage of one set of data and one locality, little of an etiologic nature may be apparent. Studied together these data may form an important picture and yield valuable knowledge to help conquer human cancer. From the funds available for the study of cancer, such a project as is here suggested may be easily financed. There is required only the leadership and organization. The international attitudes of the postwar world will no doubt make such studies most desirable.

ABSORPTION AND EXCRETION OF RADIOACTIVE ZINC AND IRON

Among the contributions to our knowledge of metabolism resulting from studies of radioactive chemical elements, few are of greater clinical interest than determination of the method of elimination of zinc and of the gastrointestinal absorption of iron reported by Montgomery and his colleagues [1] of the University of California and by Hahn and his co-workers [2] of the University of Rochester.

In 1927 Drinker [3] found that in cats long continued ingestion of zinc leads to fibrotic changes in the acinar portions of the pancreas, the islet tissues remaining unchanged. This suggested that the acinar portion of the pancreas is concerned in the metabolism of zinc. The increased use of protamine zinc insulin gave special interest to this observation. Montgomery studied the fate of intravenously injected radiozinc (Zn^{65}) in dogs with biliary, duodenal and pancreatice fistulas. The injected dose was usually 1 microgram per kilogram of body weight, an amount which did not materially increase the previously existing zinc concentration in the animal.

Assays of the labeled zinc in the tissues and excretions of these animals showed that the tissues in which the highest concentration of radiozinc appeared were the liver and the pancreas. The maximum deposition was observed eight hours after intravenous injection, at which time the liver contained approximately 0.34 per cent of the injected dose per gram of tissue and the pancreas 0.28 per cent. The pancreas as a whole then contained 3.1 per cent of the intravenously injected radiozinc, decreasing to 0.7 per cent by the end of seven days. Assays of the bile, duodenal secretions and pancreatic juice revealed that hardly any zinc is excreted in the bile. Relatively large amounts of zinc, however, were detected in the pancreatic juice, as much as 11 per cent of the intraveously injected dose being recovered from this juice by the end of fourteen days. Zinc was also found in large amounts in the secretions obtained from the isolated duodenal loop.

From these and other data the California physiologists concluded that there is presumably a protein, enzyme or other specific receptor in the acinar cells of the pancreas (and in the duodenal mucosa) which brings about the elective localization of zinc in this organ and its subsequent release into the pancreatic juice (and duodenal secretions).

In their earlier studies of radioactive iron (Fe^{59}) Sheline and his co-workers [4] found hardly any absorption of radioiron through the normal canine gastrointestinal mucosa. Abundant absorption of iron, however, was noted in certain anemic dogs. From this he concluded that the gastrointestinal mucosa has a dual function: (*a*) protecting the body against absorption of excessive iron, which might prove toxic, and (*b*) making possible adequate iron absorption in case of physiologic needs.

To determine the mechanism of this regulated absorption, from 1 to 10 mg. per kilogram of body weight of radioiron was fed to normal and to anemic dogs and the absorption determined by radioanalysis of the whole blood. In one series of dogs the normal control animals absorbed about 1 per cent of the ingested dose of labeled iron. In dogs rendered acutely anemic by massive bleeding (plus plasma returned) the absorption was not materially increased during the first twenty-four hours. Two weeks later, however, after much blood regeneration had occurred, the normal rate of absorption was increased tenfold. Acute anemia per se is apparently not the determining factor that increases normal absorption. Increased absorption presumably is the response to the later depletion of the reserve iron in fixed tissue cells.

Ordinary iron given to chronic anemic dogs by the intravenous route from one to six hours before the test dose of radioiron is administered does not appreciably decrease the anticipated excessive intake of ingested radioiron. Ordinary iron given by mouth, however, reduces the subsequent absorption of ingested labeled iron. Iron absorption through the gastrointestinal mucosa is therefore presumably "blocked" as a result of the preliminary dose of natural iron, blockade of the more distant liver, spleen or bone marrow cells being

1. Montgomery, M. L.; Sheline, G. E., and Chaikoff, I. L.: J. Exper. Med. **78:** 151 (Sept.) 1943.
2. Hahn, P. E.; Bale, W. F.; Ross, J. F.; Balfour, W. M., and Whipple, G. H.: J. Exper. Med. **78:** 169 (Sept.) 1943.
3. Drinker, K. R.; Thompson, Phebe K., and Marsh, M.: Am. J. Physiol. **80:** 31 (March) 1927.
4. Sheline, G. E.; Chaikoff, I. L.; Jones, H. B., and Montgomery, M. L.: J. Biol. Chem. **147:** 409 (Feb.), **149:** 139 (July) 1943.

ineffective. Local "mucosa block" was also demonstrated in isolated gastric, duodenal and jejunal pouches.

To account for this blockade, Hahn postulates the existence of an enzyme or protein in the gastrointestinal mucosa capable of combining lightly and reversibly with iron. Fully saturated, this specific iron "acceptor" would refuse to absorb additional iron. Partially depleted, the ferroacceptor would take up additional iron from the gastrointestinal contents. Hahn believes that this hypothetical iron "acceptor" is similar to the splenic "ferritin" or "apoferritin" discovered in 1937 by Laufberger [5] of Czechoslovakia. Over 20 per cent of the dry weight of splenic ferritin is iron. It can be readily changed in the test tube to iron free apoferritin without demonstrable alteration of its crystalline properties. Iron is presumably loosely held in the interstices of the ferritin molecule, from which it can be removed without altering the surface structure of the molecule. Granick [6] found that there is a 90 per cent decrease in the amount of splenic ferritin in chronic anemic horses, though the anticipated anemic increase in splenic apoferritin was not demonstrated.

The suggested theory of zinc excretion and iron absorption is of biologic interest. The side chain or specific receptor theory assumed a basic role in the development of nutritional and immunologic theory; this served a useful purpose. Determination of the function and properties of the hypothetical specific zinc receptor of the pancreas and the presumptive specific iron "acceptor" in the gastrointestinal mucosa may well cause a renaissance of this theory.

5. Laufberger, Vilem: Bull. Soc. chim. biol. **19**: 1575, 1937.
6. Granick, S., and Michaelis, L.: Science **95**: 439 (April 24) 1942.

SUBARACHNOID HEMORRHAGE

Most forms of cerebral hemorrhage occur in the later years of life or in persons whose cerebral blood vessels have been damaged by sclerosis, tumors or intercurrent infection. The condition commonly called spontaneous subarachnoid hemorrhage, however, appears frequently in youth and in early middle age and is usually difficult to associate with any precipitating influence. In this condition massive extravasation of blood into the subarachnoid space follows spontaneous rupture of a blood vessel. Hemorrhages into the same space resulting from extension of intracerebral bleeding, minor bleeding in the course of systemic infections, blood diseases or hemorrhages occurring during agonal episodes are excluded. The underlying causes of this condition are uncertain. Strauss and his co-workers [1] state that the common anatomic changes are arteriosclerosis of the cerebral blood vessels with or without frank aneurysmal defects. Inflammatory lesions of the blood vessels, they say, may also cause formation of aneurysms with ultimate rupture and hemorrhage. According to Glynn [2] the greater frequency with which aneurysms occur in the circle of Willis rather than in other muscular arteries is probably due to differences in their elastic tissue. Fetterman and Moran [3] found that arterial circles of the type usually described as "normal" were present in less than half of their series of over 200 brains. About a fourth showed interruptive anomalies involving the posterior communicating branches alone.

The available information on 150 cases of subarachnoid hemorrhage, almost all in the armed services, has been recently reviewed by Magee.[4] Because of the source, the cases are presumably confined to men and to comparatively early age groups. Magee could not find any reliable premonitory sign of aneurysm or its rupture. Headache of migrainous type, however, in young persons in whom a relevant family history cannot be obtained should arouse suspicion; a concurrent ocular palsy would be of further value and should lead to roentgenologic examination. In most cases the symptoms appear suddenly and the victim becomes stricken without premonitory warning. In the majority of cases violent headache is the most important presenting symptom. This usually is accompanied by moderate pyrexia, vomiting and rigidity of the neck, which in many instances results in the false suspicion of meningitis. Vascular hypertension was rarely found in Magee's series; positive serologic reactions for syphilis were not obtained in any cases.

The primary object of these investigations was to determine the relation, if any, of physical strain to subarachnoid bleeding and to rupture of aneurysms of the circle of Willis. Strain has sometimes been advanced to explain the departure from the ordinary age and physical condition of those sustaining this type of cerebral hemorrhage. The analysis did not reveal any evidence, however, that physical effort or strain acts as an etiologic factor.

The gravity of subarachnoid hemorrhage is well known; in Magee's series the mortality rate was 56 per cent. In his series of 150 patients 105 either died or were seriously crippled by paralytic sequels, incapacitating headache or vertigo. A second hemorrhage occurred in 50 of the 150 patients, and this represents an even more grave prognosis when it is realized that 52 of the 150 died in the primary attack. The 50 recurrences therefore occurred among the 98 survivors of the first attack. The prospects of good recovery diminished with advancing years; few of those examined subsequently to an attack were entirely free from symptoms. Necropsy in 58 of the 84 fatal cases

1. Strauss, Israel; Globus, J. H., and Ginsburg, S. W.: Spontaneous Subarachnoid Hemorrhage, Arch. Neurol. & Psychiat. **27**: 1080 (May) 1932.
2. Glynn, L. E.: Medial Defects in the Circle of Willis and Their Relation to Aneurysm Formation, J. Path. & Bact. **51**: 213 (Sept.) 1940.
3. Fetterman, G. H., and Moran, T. H.: Anomalies of the Circle of Willis in Relation to Cerebral Softening, Arch. Path. **32**: 251 (Aug.) 1941.
4. Magee, C. G.: Spontaneous Subarachnoid Hemorrhage, Lancet **2**: 497 (Oct. 23) 1943.

disclosed 43 ruptured aneurysms; these were more common in the anterior half of the circle and on the right side than on the left. The latter observation is the reverse of that commonly found in intracerebral hemorrhage of other varieties, but its explanation is obscure.

The fundamental cause of subarachnoid hemorrhage according to present knowledge appears to lie in a congenital defect—perhaps minor—involving an anatomic area with lower margin of safety than most portions of the human body. If correct, this explanation might be substantiated in part from embryologic investigations which do not yet seem to have been applied to this problem in a decisive manner.

Current Comment

MINERAL OIL IN FOODS

Elsewhere in this issue (page 967) of THE JOURNAL appears a statement prepared by the Council on Foods and Nutrition relative to mineral oil (liquid petrolatum) in foods. Basically, salad dressings made with mineral oil cannot be differentiated, except in a laboratory, from ordinary products containing true fats or oils like olive oil. Such products are frequently bought in large amounts by hotels and restaurants. The person who receives a salad on which such a dressing has been placed has no idea as to the nature of the material that is being used. Mineral oil is plentiful; it can be purchased without ration points and can be sold much more cheaply than can olive oil or other vegetable oils. As will be observed from the report of the Council on Foods and Nutrition, however, there are also many other reasons why mineral oil should not be taken without a clear understanding of the nature of the substance. The ingestion of liquid petrolatum is capable of interfering seriously with the absorption of carotene, the precursor of vitamin A, with vitamin A itself, and also with vitamin D, calcium, phosphorus and vitamin K. The prolonged use of mineral oil may be associated with disturbances related to deficiencies of such vitamins. Proctologists report difficulty in visualizing the walls of the bowel because of a dark film of oil. Occasionally seepage occurs. Indeed, one writer has described a series of symptoms definitely related to continuous use of liquid petrolatum. Sometimes such products are sold in one to five gallon containers purchased largely by hotels and restaurants, since householders do not use such quantities. There are, for instance, a product called Thallon-Naise made in New York, a mayonnaise packed for H. L. Barker, Inc., New York, a mineral oil dressing made by J. H. Filbert Inc., Baltimore, a product called Slenderit manufactured by Marquis Products Company of Portland, Ore., and Beck's Pure U. S. P. Mineral Oil furnished by Beck's Mayonnaise Products of Davenport, Iowa, as well as others. Mineral oil is used in the baking industry in the place of animal and vegetable oils. Certainly the consumer should have the right to know the nature of the substance that he is using and the possible harmful effects associated with the substitution of liquid petrolatum for what he considers to be a food.

THE EXPERIMENTAL PRODUCTION OF PERIARTERITIS NODOSA

Recent research indicates that certain etiologically obscure diseases may be dependent on an increased reactivity of tissue to foreign substances. This is notably and definitely so in the case of periarteritis nodosa, which has been ascribed to a great variety of possible causes. Diverse clinical observations pointing to a relationship between serum disease and periarteritis nodosa led Rich [1] to make experiments in the course of which typical lesions of periarteritis nodosa were produced in rabbits. Relatively large quantities of sterile horse serum were injected and after twelve days or so skin tests revealed hypersensitiveness to the serum. The intravenous introduction of 1 cc. of horse serum a few days later was followed by the development of characteristic widely spread lesions of periarteritis nodosa, which in this case might be spoken of as a serum disease of the arteries or as a manifestation of a special arterial hypersensitiveness to horse serum. Probably other antigenic substances than those in horse serum may have similar effects on sensitized tissues, human or animal. Here lies a promising field for further experimentation. Rich and Gregory [2] mention interesting results with compounds of proteins with sulfonamides. For the present periarteritis may perhaps be regarded as a pattern of arterial reaction to antigenic substances rather than as a disease due to a single cause. The histories of patients with periarteritis nodosa should be studied thoroughly with respect to possible specific sensitizations, infectious or otherwise. In some of the rabbits in the experiments, acute glomerulonephritis was present. This naturally raises the question whether human glomerulonephritis, as well as other forms of acute nephritis, like the interstitial, may not be of the nature of reactions of hypersensitiveness—also a problem for experimental study. In reporting a remarkable instance of progressive, disseminated lupus erythematosus, fatal in four months, the first symptoms of which appeared one week after a prophylactic dose of antitetanic serum in a girl 17 years old, Fox [3] discusses at length the question whether this case may not have been a protracted form of serum disease. Fox stresses the need of clinical and experimental study of the relations of specific antigens to disseminated lupus erythematosus and of the effects of actinic rays on sensitized tissues.

1. Rich, A. R.: The Role of Hypersensitivity in Periarteritis Nodosa, Bull. Johns Hopkins Hosp. **71**: 123 (Sept.) 1942.
2. Rich, A. R., and Gregory, J. E.: Experimental Demonstration that Periarteritis Nodosa is Manifestation of Hypersensitivity, Bull. Johns Hopkins Hosp. **72**: 65 (Feb.) 1943.
3. Fox, R. A.: Disseminated Lupus Erythematosus—An Allergic Disease, Arch. Path. **36**:311 (Sept.) 1943.

MEDICINE AND THE WAR

In this section of The Journal each week will appear official notices by the Committee on War Participation of the American Medical Association, announcements by the Surgeons General of the Army, Navy and Public Health Service, and other governmental agencies dealing with medicine and the war, and such other information and announcements as will be useful to the medical profession.

ARMY

SURGEON GENERAL KIRK ISSUES STATEMENT ON PENICILLIN

Because of numerous requests received by the army for penicillin, Surg. Gen. Norman T. Kirk of the Army Medical Department explained on November 23 that the War Department "at no time has either controlled penicillin or received the entire output." The army's position with regard to penicillin supply is exactly the same as that of the Navy, U. S. Public Health Service and the Office of Scientific Research and Development, each of which receives a monthly allocation of penicillin from the War Production Board. General Kirk also explained that the penicillin allocated to the Army Medical Department is intended for the treatment of military personnel and "none of it can be reallocated or released to civilians." This month, according to the War Production Board, the Army will receive 56 per cent of the total supply, the Navy 18 per cent, the U. S. Public Health Service (for the treatment of Coast Guard and Merchant Marine personnel) 2 per cent, the Office of Scientific Research (for civilians) approximately 15 per cent, and the scientific staffs of drug companies the remainder for their own research. Though production of the drug is steadily increasing, at present none of the agencies, including the military, receive as much as they need. Its distribution among military and naval personnel is determined by the army, navy and the public health service. Distribution of the part allocated to civilians is for clinical research and its assignment is determined by a committee headed by Dr. Chester S. Keefer, Evans Memorial Hospital, Boston. Since the amount of penicillin requested by civilians greatly exceeds the available supply, it has been determined by the Office of Scientific Research and Development that requests by civilians must be made through their doctors, who should communicate with Dr. Keefer by telephone, telegram or personal letter, giving complete details of the case so that he may have an adequate basis for his decision.

SPECIAL BOARD OF OFFICERS TO STUDY CLINICAL TREATMENT OF MALARIA

Major Gen. Norman T. Kirk, Surgeon General of the Army, has appointed a special board of officers to study the clinical treatment of malaria. Two hundred beds were ordered set aside for the purpose of the study in each of the following general hospitals: Bushnell (Brigham, Utah), Harmon (Longview, Texas), Kennedy (Memphis, Tenn.) and Percy L. Jones (Battle Creek, Mich.). Major Gen. Shelley U. Marietta is the senior officer of the new board, and other members are Col. George R. Callender, Lieut. Col. Thomas T. MacKie, Lieut. Col. Francis R. Dieuaide and Major O. R. McCoy, all medical corps officers.

LIEUT. PHILIP G. CREESE AWARDED SOLDIER'S MEDAL

The War Department announced on December 4 an award of the Soldier's Medal to Lieut. Philip G. Creese for "heroism displayed in rescuing an enlisted man from drowning. While he was participating in landing exercises on a beach in England a landing craft was swamped and a number of men were thrown into the surf. One man was carried offshore by the swell and in a few minutes was in a drowning condition. Lieutenant Creese, without hesitation, plunged into the surf and brought the drowning soldier far enough toward shore for others to assist in the rescue." Dr. Creese graduated from Harvard Medical School in 1942 and entered the service in March 1943.

THE FOSTER GENERAL HOSPITAL

The Foster General Hospital, which was formally dedicated on September 18, is located in Jackson, Miss. The hospital is modern in every respect and is furnished with the finest medical and surgical equipment available. It has a semipermanent brick construction with a total bed capacity of 1,768. It maintains its own fire station, ambulance corps, engineering division, warehouses for medical supplies and hospital equipment and is set off into wards for treatment of enlisted personnel with a number of small rooms for officers. Operating rooms and dental clinics occupy a section of the hospital. In addition to the facilities for patients there are several large mess halls, an officers' club and quarters for officers, nurses, and enlisted men. At the present time this hospital has not been designated for any special medical work but is receiving routine general hospital cases from overseas theaters.

The Foster General Hospital was named for the late Col. Charles L. Foster, Mississippi army physician for many years.

Col. Sam F. Parker is commanding officer of the Foster General Hospital. The remaining personnel which staffs the hospital are:

Lieut. Col. Edward J. Doyle, executive officer.
Lieut. Col. Marshall E. Hyde, chief, medical service.
Lieut. Col. Edmund Horgan, chief, surgical service.
Major Reubin R. Pliskin, assistant chief, medical service.
Major John M. Cotton, chief, neuropsychiatry section.
Major George M. Knowles, medical service.
Major James M. Kinsman, medical service.
Major Samuel M. Salley, medical service.
Major Armand J. Mauzey, surgical service.
Major Clair S. Linton, chief, eye, ear, nose and throat clinic.
Major Saul Ritchie, chief, orthopedic section.
Major Joseph E. Noll, chief, x-ray service.
Major Michael Brylawski, chief, laboratory service.
Capt. Clarence L. Miller, medical service.
Capt. George H. Butler, medical service.
Capt. Otto Hitschmann, medical service.
Capt. Joseph G. Cole, medical service.
Capt. Emanuel Sigoloff, medical service.
Capt. Arthur J. Shapiro, medical service.
Capt. Conrad G. Collins, assistant chief, surgical service.
Capt. Ernest W. Akins, surgical service.
Capt. Gerold H. Friedman, surgical service.
Capt. Edward W. Nelson, surgical service.
Capt. Fred L. Norton, surgical service.
Capt. Edward B. Weinman, surgical service.
Capt. Samuel Soifer, chief, genitourinary clinic.
Capt. Harry J. Keys, post surgeon.
Capt. Leo G. Glickman, assistant chief, x-ray service.
1st Lieut. Fay B. Murphy, medical service.
1st Lieut. John G. Egger, medical service.
1st Lieut. Alexander A. Kreuger, medical service.
1st Lieut. Horace T. Greene, medical service.
1st Lieut. Dale F. Johnson, medical service.
1st Lieut. Salo Vogel, medical service.
1st Lieut. Marvin W. Lathram, medical service.
1st Lieut. Thomas J. Ellis, surgical service.
1st Lieut. Ivey E. Lamberth, anesthetist.
1st Lieut. Clifford W. Losh Jr., surgical service.
1st Lieut. Harry J. Mitchell Jr., surgical service.
1st Lieut. Herbert P. Swartz, medical service.
1st Lieut. Dionisus V. Cacioppo, surgical service.
1st Lieut. George T. Wohl, assistant post surgeon.
1st Lieut. Stanley F. Boc, laboratory service.
1st Lieut. Dewitt F. Mullins Jr., laboratory service.

GENERAL LULL DEDICATES WAR BOND BANNER

Major Gen. George F. Lull, Deputy Surgeon General, dedicated the "Minute Man Banner" awarded to civilian War Department employees of the Surgeon General's Liaison Office on duty at the headquarters of the American Medical Association, Chicago, November 9.

In making the award of the banner, which was authorized by the chief of finance, United States Army, General Lull commended the employees on their full participation and large subscriptions of war saving bonds. He said the record established at the Surgeon General's Liaison Office exceeded that of some Washington offices, including the Office of the Surgeon General. All civilian employees on duty at the Liaison Office have authorized payroll deductions for war saving bonds amounting to 12 per cent of their gross earnings. Present at the dedication were Col. Don G. Hilldrup, chief, Medical Branch, Sixth Service Command; Dr. Adolph Rumreich, senior surgeon, United States Public Health Service, liaison officer to the Sixth Service Command, U. S. Army; Dr. Edwin P. Jordan, assistant editor of THE JOURNAL, and Lieut. Col. Harold C. Lueth, M. C., liaison officer.

PROCUREMENT AND ASSIGNMENT SERVICE FOR PHYSICIANS, DENTISTS AND VETERINARIANS

HOSPITALS NEEDING INTERNS AND RESIDENTS

The following hospitals have indicated to the Council on Medical Education and Hospitals that they have not completed their Procurement and Assignment Service quotas for Jan. 1, 1944:

(Continuation of list in THE JOURNAL, December 4, p. 912).

COLORADO

Childrens Hospital, Denver. Capacity, 215; admissions, 5,238. Mr. DeMoss Taliaferro, Director (resident—pediatrics).

National Jewish Hospital, Denver. Capactiy, 257; admissions, 205. Dr. Charles J. Kaufman, Medical Director (2 assistant residents—tuberculosis).

CONNECTICUT

Danbury Hospital, Danbury. Capacity, 235; admissions, 3,541. Miss Anna M. Griffin, R.N., Superintendent (2 interns).

GEORGIA

University Hospital, Augusta. Capacity, 345; admissions, 10,892. Dr. William H. Goodrich, Medical Superintendent (4 interns).

ILLINOIS

American Hospital, Chicago. Capacity, 194; admissions, 4,365. Dr. Solomon Greenspahn, Medical Director (3 interns, 2 residents).

Chicago Memorial Hospital, Chicago. Capacity, 108; admissions, 2,713. Miss Josephine O. Blalock, Superintendent (1 intern).

Englewood Hospital, Chicago. Capacity, 157; admissions, 6,232. Mr. A. R. Zeiter, Superintendent (3 interns).

Manteno State Hospital, Manteno. Capacity, 6,576; admissions, 1,576. Mr. Rodney H. Brandon, Superintendent (resident—psychiatry).

St. Francis Hospital, Peoria. Capacity, 510; admissions, 13,436. Sister M. Ancilla, R.N., Superintendent (1 intern).

Rockford Municipal Tuberculosis Sanatorium, Rockford. Capacity, 124; admissions, 162. Dr. William J. Bryan, Medical Director and Superintendent (resident—tuberculosis).

KENTUCKY

Kosair Crippled Children Hospital, Louisville. Capacity, 125; admissions, 1,310. Miss Anna B. Quinn, Superintendent (resident—orthopedics).

MAINE

Maine General Hospital, Portland. Capacity, 329; admissions, 7,079. Dr. Stephen S. Brown, Medical Director (3 interns).

MASSACHUSETTS

Grafton State Hospital, North Grafton. Capacity, 1,750; admissions, 254. Dr. Harlan L. Paine, Medical Superintendent (resident—psychiatry).

Shriners Hospital for Crippled Children, Springfield. Capacity, 60; admissions, 301. Miss Dorothy Forsythe, R.N., Superintendent (resident—orthopedics).

MICHIGAN

Leila Y. Post Montgomery Hospital, Battle Creek. Capacity, 175; admissions, 4,923. Sister M. Constance, Superintendent (resident—mixed).

St. Joseph's Mercy Hospital, Detroit. Capacity, 285; admissions, 9,742. Sister Mary Camilla, R.N., Superintendent (2 interns).

Blodgett Memorial Hospital, Grand Rapids. Capacity, 206; admissions, 4,553. Mr. William W. Colton, Director (resident—surgery).

St. Lawrance Hospital, Lansing. Capacity, 230; admissions, 11,041. Sister Mary Assisium, Superintendent (3 interns).

MINNESOTA

Fairview Hospital, Minneapolis. Capacity, 192; admissions, 5,255. Mr. E. M. Hauge, Superintendent (assistant resident—mixed).

Nopeming Sanatorium, Nopeming. Capacity, 260; admissions, 279. Dr. G. A. Hedberg, Medical Superintendent (resident—tuberculosis).

NEBRASKA

Douglas County Hospital, Omaha. Capacity, 408; admissions, 2,781. Dr. F. J. Wearne, Medical Director (2 residents—mixed).

NEW HAMPSHIRE

Elliot Hospital, Manchester. Capacity, 154; admissions, 2,567. Mrs. Elizabeth M. McKay, R.N., Superintendent (resident—mixed).

NEW JERSEY

West Jersey Homeopathic Hospital, Camden. Capacity, 320; admissions, 5,775. Mr. F. B. Gail, Manager (3 interns).

East Orange General Hospital, East Orange. Capacity, 150; admissions, 4,266. Mr. Charles Lee, Superintendent (3 interns).

St. Elizabeth Hospital, Elizabeth. Capacity, 266; admissions, 4,757. Sister Alice Regina, Superintendent (3 interns).

Christ Hospital, Jersey City. Capacity, 206; admissions, 5,710. Mr. Ernese F. Schultz, Superintendent (3 interns).

St. Mary's Hospital, Passaic. Capacity, 237; admissions, 5,363. Sister Martha Eucharia, R.N., Superintendent (2 interns).

NEW YORK

Greenpoint Hospital, Brooklyn. Capacity, 300; admissions, 6,352. Dr. Rudolf Raff, Medical Superintendent (1 intern).

Nassau County Sanatorium, Farmingdale. Capacity, 412; admissions, 314. Dr. J. C. Walsh, Medical Superintendent (resident—tuberculosis).

Mary Immaculata Hospital, Jamaica. Capacity, 316; admissions, 8,692. Sister M. Eugenia, R.N., Superintendent (3 interns).

New York State Psychiatric Institute and Hospital, New York. Capacity, 152; admissions, 309. Dr. Nolan C. Lewis, Medical Director (resident—psychiatry).

United Hospital, Port Chester. Capacity, 218; admissions, 5,089. Mr. Carl P. Wright Jr., Superintendent (2 interns).

Richmond Memorial Hospital, Staten Island. Capacity, 118; admissions, 1,902. Mr. John H. Olsen, Managing Director (2 residents—mixed).

OKLAHOMA

Bone & Joint Hospital, Oklahoma City. Capacity, 41; admissions, 669. Mr. C. E. Babcock, Superintendent (resident—orthopedics).

PENNSYLVANIA

St. Vincent's Hospital, Erie, Capacity, 334; admissions, 10,478. Sister M. Elizabeth, Superintendent (1 intern).

Montgomery Hospital, Norristown. Capacity, 160; admissions, 4,451. Mrs. Helen T. Stabler, R.N., Superintendent (2 interns).

Women's Homeopathic Hospital, Philadelphia. Capacity, 200, admissions, 2,810. Mrs. Edna J. Griffin, R.N., Superintendent (intern, assistant resident—mixed).

Allegheny General Hospital, Pittsburgh. Capacity, 608; admissions, 10,501. Dr. George L. Wessels, Medical Superintendent (assistant resident—pathology).

Montefiore Hospital, Pittsburgh. Capacity, 257; admissions, 7,492. Mr. Sidney M. Bergman, Director (1 intern).

Presbyterian & Woman's Hospitals, Pittsburgh. Capacity, 352; admissions, 5,540. Miss Mary Miller, R.N., Superintendent (2 interns, assistant resident).

SOUTH CAROLINA

Columbia Hospital, Columbia. Capacity, 305; admissions, 7,905. Mr. J. B. K. de Loach, Superintendent (resident).

TEXAS

St. Joseph's Infirmary, Houston. Capacity, 448; admissions, 15,398. Sr. Mary Baptista, R.N., Superintendent (resident—mixed).

WEST VIRGINIA

Ohio Valley General Hospital, Wheeling. Capacity, 328; admissions, 8,275. Mr. J. S. Turk, Superintendent (2 interns).

WISCONSIN

St. Elizabeth Hospital, Appleton. Capacity, 215; admissions, 4,741. Sister Mary Venantia, Superintendent (1 intern).

St. Michael Hospital, Milwaukee. Capacity, 175; admissions, 5,043. Sister M. Alphonse, Superintendent (intern).

MISCELLANEOUS

REHABILITATION OF RUSSIAN TERRITORY FORMERLY OCCUPIED BY NAZIS

[NOTE.—*From Moscow, via press wireless, the Soviet Scientists Antifascist Committee has sent this article under the title Humane Mission of Medical Science, by Academician Nikolai Burdenko, Hero Socialist-Labor and Chairman Scientific Medical Council of the Peoples' Commissariat of Health.*—ED.]

The great patriotic war has reached its zenith. Fierce battles are in progress along the Dnieper. The routed hitlerite armies are retreating. Thanks to brilliant victories of Soviet arms, an enormous amount of territory has been cleared of the enemy and tens of millions of inhabitants have been liberated from the yoke of the barbarians.

The meeting between the population and the Red army's men was a never to be forgotten spectacle. People rushed forth to meet their liberators with outstretched arms. They expressed in every way their happiness at being freed from fascist prison; from unbearable moral and physical torture; from hunger, cold, mockery, beatings and slavery.

The extent of the material losses and destruction caused by the savage occupationists defies estimation. In order to get some idea of the enormous tasks facing us in the liberated territories it is necessary for people who have gone through the ordeal of the German occupation to speak or to read their depositions. They have suffered inhuman murders, public executions before crowds forced to witness them, beatings, violation of women in front of their children, the ravishing of young girls—all this has left permanent scars on them both mentally and physically. Here the work of builders is insufficient; here one cannot confine oneself to the restoration of material objectives. The health of sufferers must be restored, and this places tremendous responsibility on medical workers.

The guiding principle of medical workers remains the same—Everything for War! At the same time medical workers are giving more and more attention to the medical service for liberated territory. This is basic in the new plan of action of both the workers' public health commissariat and the scientific medical council directing research in Russia. One of the most vital and urgent tasks is to stamp out epidemics in liberated cities and villages where typhus, dysentery, diphtheria and other diseases are rampant.

The problem of diphtheria, which affected great masses of children under the Germans, demands new and deeper study. Venereal diseases, syphilis and gonorrhea, are another serious and pernicious result of the German occupation. In their debauchery and crimes the Hitlerites sowed contagion. The number of cases of these diseases among German units was so great that the German staff doctors issued special daily bulletins on the subject. During the latter half of 1942 active syphilis and mass scale gonorrhea broke out in Smolensk among German soldiers and the population.

Equally vital is the problem of tuberculosis. The use of the term epidemic tuberculosis applied to this disease by the Peoples' Commissariat of Health is nowhere more justified than in the German occupied territories. Under the Germans tuberculosis became a mass disease with fatal results among thousands of persons forced by the Germans to do compulsory labor.

At the same time the invaders destroyed the entire network of antituberculosis institutions and deprived the sufferers of medical treatment. Children in particular have suffered from this disease. Clinics have been opened in Orel, Kursk and Smolensk. They record an increase in cases of children with colds in whom manifestations of lymphadenitis have been observed.

The hunger rations on which Germans had kept the population over a long period of time brought the usual results: swelling due to lack of albumin, anemia, hypoproteinemia, scurvy and a number of trophic disorders connected with avitaminosis, for instance amenorrheas.

In order to cure these diseases, sources of new foods must be found on a countrywide scale. There should be mass production of vitamins, standard preparations and synthetic substitutes. Endocrinologists are faced with new tasks in connection with glandular therapy for cases of premature aging and debility.

In the sphere of nutrition, children were the center of attention. Millions of infants have been deprived of normal breast feeding as the result of hypogalactia. Lacking mother's milk they did not receive necessary nourishment in the form of protein, fats and carbohydrates. The children are our future. It is the duty of doctors and scientists to put them on their feet and to see that their defective nourishment is compensated and thus to eliminate the results of the crimes of the fascist brutes.

The neuropsychiatric condition of the population of the liberated areas also needs attention. How much mental torture these people have lived through! How many people were left with shattered nerves who require aid of an understanding doctor and special treatment! I myself conducted a questionnaire as to the kind of work intellectual persons—engineers, technicians, teachers—did under the Germans. They presented a terrible picture of humiliation and persecution. Teachers were particularly abused. Elderly men and women were made to do heavy physical labor. When asked whether they could return to their old posts, they replied "We have not the strength to do so; we need a little time for rest."

There were innumerable cases of violation of women and girls.

It is necessary to open psychoneurologic and psychotherapeutic clinics and sanatoriums in order to help restore the morale of those who suffered at the hands of the Germans.

All this demands restoration of the entire communal system of public health and hygiene. Entire cities, among them Mtsensk, Livny, Orel and Smolensk, have been practically razed to the ground by the Hitlerite bandits.

Thousands of the Soviet people were shot by Germans in the streets of cities and outlying villages. The executioners hastily threw the bodies in holes. The soil is polluted and requires strict sanitary control by doctors to prevent possible pernicious consequences.

The scientific medical council and the peoples' commissariat of health of the Union of Soviet Socialist Republics are concentrating attention on all these problems. They are making profound study of the needs of the liberated areas, assigning corresponding tasks to scientific research institutions and outlining their activities. The councils are convening plenum scientific councils of the union and fraternal republics for detailed discussion of the problems to be solved and the tasks to be fulfilled.

PSYCHIATRIST OF BRITISH ARMY PRAISES U. S. MENTAL TESTS

Brig. J. R. Rees, chief of the neuropsychiatric service of the British army, recently told of the technic of American doctors enabling the return to active duty of 60 per cent of a group of soldiers who in the last war would have been known as shell shock cases. The American system, he said, was "far ahead of anything we have in England." Brigadier Rees further states that England has looked to the United States as "the home of progress in psychiatry." He said that America had done "magnificent work" in the last war in psychologic testing of prospective soldiers and that not only England but Germany also has borrowed largely from American procedure.

U. S. CADET NURSE CORPS

In a recent announcement by Miss Lucile Petry, director Division of Nurse Education, U. S. Public Health Service, Federal Security Agency, it is stated that the Bolton act funds have been allocated to thirty-two colleges and universities for all expense scholarships in postgraduate programs in nursing education, including public health nursing. Additional applications are still under consideration. The announcement pointed out that these scholarships are available to graduate nurses who show an aptitude for teaching and for public health nursing and to those nurses now on staffs who are in line for advancement or who feel the need of additional courses.

PUBLIC HEALTH UNDER HITLER

According to DKD of August 25, German medical science is working without respite to banish the dangers threatening the health of the soldiers in the extensive front zones of the war. The new German newsreel shows pictures of the research and the experiments on combating malaria carried out at the Institute for Tropical Medicine of the Academy for Military Medicine in Berlin. We are shown the practical application of the remedies developed there in the marshy areas of the Kuban front, where special powders are sprayed from aircraft over wide areas to destroy the breeding places of the midges which are the carriers of malaria infection.

Novoe Vremya of July 28 states that, by urgent order of the competent authorities, doctors in private practice are reminded that it will be at their own risk and peril if, when giving medical certificates to persons employed in the German armed forces, they fail to exercise the most rigorous, unbiased professional accuracy within the meaning of the regulations defining the form, content and manner of issue of medical certificates.

According to the *Hamburger Fremdenblatt* of August 24 the inoculations against typhus, which are free of charge, will continue during the next week for all Volksgenossen who have not yet found time to have it done. Every one who wishes to protect himself against typhus by being inoculated in advance is therefore given another opportunity to do so. On principle the inoculations take place only at the ARP first aid posts and in individual large concerns but not in the surgeries of doctors.

Dnes of July 1 states that, owing to the shortage of doctors, medical students after a five years course will have their one year of training not in the university hospital but as employees of the chief public health directorate in villages.

According to Radio Paris of September 20 the relief train visited by Petain and Laval on September 19 in Vichy includes a hospital car of 30 beds, a surgery car with x-ray and blood transfusion apparatus, a dressing ward, a maternity car (birth room and rest room), kitchens, reserves of clothes and utensils for air raid victims.

ORGANIZATION SECTION

THE WAGNER-MURRAY-DINGELL BILL

Open Letter of Massachusetts Medical Society to its Representatives in Congress

[This open letter has been sent to the Massachusetts representatives in Congress. It is expressive of the point of view of the Massachusetts Medical Society, a point of view which is shared with the Medical Societies of Maine, New Hampshire, Vermont, Rhode Island and Connecticut, with regard to Senate bill 1161 and House bill 2861, the so-called Wagner-Murray-Dingell bills.]

Dear Sir:

The Massachusetts Medical Society, in conjunction with the Medical Societies of Maine, New Hampshire, Vermont, Rhode Island and Connecticut, has studied Senate Bill 1161 and House Bill 2861 now before the Congress of the United States and respectfully submits its views on this proposed legislation.

We approve of the broad medical objective of the act that we interpret to be an attempt to improve the health of our people. As a basis of our approval we cite the progressive leadership which the physicians of New England have always shown in the development of public health enterprises. For more than fifty years we have consistently supported the plea for the establishment of a National Department of Health with a secretary in the President's cabinet, under whom would be coordinated many important public health programs, exclusive of the Army and Navy. These are now scattered through various departments and bureaus of the federal government and already play a large role in the provision of medical care for the people of this country.

We approve of the use of the insurance principle on a voluntary basis as a means to aid the individual to budget against the cost of medical care. We maintain that, when insurance programs are not directly under the supervision of the medical profession by whom medical care is to be rendered, they should provide for cash benefits to be paid to the individual, for we firmly believe that the citizens of New England are capable of using cash benefits to pay the cost of medical care.

We believe that S. 1161 and H. 2861 do not provide for the sound development of a national health program. It is implied by the act that the distribution of compulsory savings managed by federal authorities will guarantee better health for all of the people. We sincerely doubt that such an objective can be realized in this way. In the New England states, judged by any standards with which we are familiar, there is no need to revolutionize the habits of the people in their methods of obtaining medical care.

Private enterprises in the field of voluntary prepaid medical and hospital insurance are increasing rapidly. These facilities should be utilized by the states, if necessary through federal grants-in-aid, so that each state can purchase medical care for those who cannot purchase it for themselves. This we believe to be a development that would be acceptable to the New England people, for thereby medical care could be provided even for the indigent, who are public charges, a provision most desirable in those communities that have been unable or unwilling to meet this obvious responsibility.

We shall be glad to work out plans with representatives of the federal and state governments to improve the health of all the people, but we should expect that any plans that might be devised would take full advantage of existing agencies and be developed within the social patterns that are well understood by our people.

Very truly yours,

MICHAEL A. TIGHE, M.D.
Secretary.

ROGER I. LEE, M.D.
President.

NATIONAL PHYSICIANS' COMMITTEE ADOPTS PROGRAM

At the annual meeting of the National Physicians' Committee Board of Trustees at Chicago, November 20-21 a greatly expanded program of educational efforts was formulated and officially confirmed. With unanimous approval the following resolution was adopted:

WHEREAS, The preservation of the principles fundamental to maintaining the quality of American medicine requires the development and encouragement of plans for meeting the cost of unusual or prolonged illness; and

WHEREAS, A survey of methods already available for prepayment costs indicates that facilities are in existence to provide for at least the most pressing demands; therefore be it

Resolved, That the Management Committee is authorized, and the Administrator is authorized and instructed, to proceed with efforts designed to:

(*a*) Encourage the medical profession to active participation in the development of plans and the more general use of existing facilities to provide for easy payment of insurance against unusual or prolonged illness;

(*b*) Educate the people to the importance, nature and value of prepayment facilities, within the framework of principles approved by the medical profession, now available for meeting the costs of unusual illness;

(*c*) Investigate conditions relating to and inform industry concerning the principles underlying sound participation with employees in prepayment plans for meeting the cost of unusual or prolonged illness and hospitalization;

(*d*) Inform private insurance underwriters of the opportunity that is being offered through cooperation in nationwide efforts to provide group insurance policies for those needing or desiring insurance against the hazards of unusual illness;

(*e*) Encourage contributors and friends to a greater degree of participation in the efforts of the National Physicians' Committee in this constructive program.

MEDICAL LEGISLATION

DISTRICT OF COLUMBIA

Bill Introduced.—S. 1546, introduced by Senator O'Daniel, Texas, for Senator McCarran, Nevada, proposes to amend an act relating to the incorporation of Providence Hospital in the District of Columbia to (1) change the name of the corporation to the "Providence Hospital" and (2) authorize the corporation to conduct not only a hospital, clinic and all the departments, staffs and services usually connected therewith, but also a school for the education and training of nurses and interns with full power to examine said nurses and interns and to issue suitable certificates evidencing the completion of their courses of training.

MEDICAL BILLS IN CONGRESS

Change in Status.—H. R. 3598, the First Supplemental National Defense Appropriation Act, 1944, has been reported to the Senate with amendments. It does not include any appropriation to enable the Public Health Service to provide medical care for communities critically in need of such care. Senator Russell, Georgia, however, has given notice that he will offer from the floor of the Senate an amendment to provide $345,000 to enable the Surgeon General of the Public Health Service, on application of a city, county or other local subdivision of government duly approved by the state health department having jurisdiction over the city, county or other local subdivision of the government, to enter into agreements with private practicing physicians and dentists under which, in consideration of the payment to them of a relocation allowance of not to exceed $250 per month for three months and actual cost of travel and transportation of the physician or dentist and his family and household effects to the new location, such physician or dentist will agree to move to and engage in the practice of his profession in such area for a period of not less than one year. This amendment will provide that no such contract may be entered into with any physician or dentist unless such physician or dentist shall be admitted to practice by the state authority having jurisdiction of the new location. Each applicant subdivision, moreover, will be required to contribute $100 to the total cost of such relocation allowance, travel and transportation costs of each such physician or dentist and his family obtained by said applicant.

Bills Introduced.—S. 1566, introduced by Senator Wiley, Wisconsin, proposes to consolidate and coordinate government activities affecting the reestablishment and rehabilitation of veterans in the Veterans' Administration. H. R. 3717, introduced by Representative Rolph, California, proposes to amend a joint resolution approved April 29, 1943 making an appropriation to assist in providing a supply and distribution of farm labor for the calendar year 1943, so as to authorize the use of the funds in furnishing, by loan or otherwise, of health and medical services to migrant workers engaged in agricultural work, and to members of the families of such workers, to which adequate health and medical services are not otherwise available in the area where they are employed, whether or not such workers have been recruited and transported pursuant to the joint resolution. S. 1943, introduced by Senator Johnson, California, is a companion bill in the Senate. H. R. 3718, introduced by Representative Sparkman, Alabama, proposes to grant military rank to certain members of the army nurse corps. H. R. 3733, introduced by Representative Barry, New York, provides for college education for qualified postwar veterans. H. R. 3761, introduced by Representative Bolton, Ohio, provides for full military rank for members of the army nurse corps, dietitians and physical therapy aides. H. R. 3779, introduced by Representative Rogers, Massachusetts, proposes to insure training and rehabilitation for men and women in the armed services.

WOMAN'S AUXILIARY

Kansas

The Shawnee County Medical Auxiliary held a meeting October 11, at the home of Mrs. E. H. Decker, Topeka. The guest speakers were the WAC's recruiting officer in Topeka and Lieut. Maude Meyers, chief nurse of the Topeka Army Air Base.

Missouri

The Missouri auxiliary held the fall board meeting in September in Jefferson City, with forty-two members and visitors present, at which time the following resolution was adopted:

Resolved, that we, the Woman's Auxiliary to the Missouri State Medical Society, do heartily endorse the movement to control cancer through education and pledge our friendly cooperation and moral support of the Missouri Women's Field Army Unit of the American Society for the Control of Cancer.

For the twelfth year the Missouri auxiliary will sponsor a health essay contest for the high school students in the state. The subject for the contest is "Civilian Health in Wartime," and cash prizes amounting to $60 will be made.

The *Quarterly Bulletin* of the Missouri auxiliary has completed its tenth year. Mrs. A. J. Crider of Dixon is the editor.

New Jersey

The Middlesex County auxiliary held its first meeting this year at Highland Park, October 20.

North Carolina

Mrs. Joseph A. Elliot, state program chairman of the Woman's Auxiliary to the North Carolina Medical Association, published in the October issue of the *North Carolina Medical Journal* the program of the auxiliary to the American Medical Association as sent out by Mrs. Oscar W. Friske, national program chairman, added to which were notes to aid in the state's special projects.

In the same issue of the *North Carolina Medical Journal* Mrs. John C. Reece, North Carolina Hygeia chairman, published the following memorandum: *"Hygeia,* remember me? I am published by the American Medical Association and I interpret scientific medical information to the lay public. I also help to support your bed fund for tuberculous patients from your subscription. Do not overlook me this year or leave me out of your reading. I will not only keep you informed but will help your auxiliary. Plan now to send in your subscription for me."

South Dakota

A meeting of the advisory board of the Woman's Auxiliary to the South Dakota State Medical Association was held on October 27 at the home of Mrs. D. S. Baughman, Madison. The members who were present were Mrs. John C. Hagin, Miller, state president; Mrs. D. S. Baughman, Madison, state president-elect; Mrs. C. E. Sherwood, Madison, state program chairman; Mrs. J. R. Westaby, Madison, chairman Benevolent Fund Committee; Mrs. E. T. Sout, Pierre, corresponding secretary and treasurer; Mrs. G. E. Burman, Carthage, state chairman, public relations and publicity, and Mrs. R. A. Buchanan, Huron.

At this meeting plans were formulated for work to be done by the district auxiliaries during the coming year. A delightful luncheon was served.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

CALIFORNIA

Changes in Faculty at Southern California.—Included among recent changes at the University of Southern California School of Medicine, Los Angeles, are the following appointments:

Dr. Justin R. Dorgeloh to assistant professor of pathology.
Walter E. Ward, Ph.D., to assistant professor of bacteriology.
Dr. Homer C. Lawson to assistant professor of pharmacology.
Dr. Ernest D. Gardner to assistant professor of anatomy.
Richard J. Winzler, Ph.D., assistant professor of biochemistry.

Osler Meeting.—Dr. Esther Rosencrantz, associate professor emeritus of medicine, University of California Medical School, San Francisco, gave an address entitled "Sir William Osler" before the Los Angeles County Medical Association and the Barlow Society for the History of Medicine on November 18. A feature of the meeting was an Osler exhibit. Dr. George Dock, Pasadena, who was one of Osler's colleagues during the Pennsylvania period, discussed a journey made with Osler in search of rare books. Dr. Rosencrantz was a member of one of the last classes taught at Johns Hopkins University School of Medicine, Baltimore, by Osler.

DISTRICT OF COLUMBIA

Health Program for Government Employees.—An employee health program for the Commerce Department, Maritime Commission and Office of the Coordinator of Inter-American Affairs was reported in the New York *Times*, November 17. The plan is designed to keep employees of the three agencies well and their work efficient by diagnosing and treating their illnesses and injuries and obtaining the services of outside physicians when necessary.

GEORGIA

Dr. Kelly Joins A. M. A. as Secretary of Public Relations.—Dr. George Lombard Kelly, since 1935 dean of the University of Georgia School of Medicine, Augusta, has been given a leave of absence to accept an appointment as Secretary of the Council on Medical Service and Public Relations of the American Medical Association, Chicago, effective January 1. Dr. Edgar R. Pund, professor of pathology at the medical school, will serve as acting dean. Dr. Kelly, a member of the Georgia staff since 1918, graduated there in 1924.

IDAHO

Personal.—Dr. David A. McClusky, Buhl, on October 15 was named medical superintendent of the State Hospital, South, Blackfoot. Dr. McClusky succeeds Dr. George Ritter Smith, who has been assigned to the state department of public health.

Society News.—Dr. Harold E. Dedman, Boise, was chosen president of the Southwestern Idaho District Medical Society at its meeting in Boise, October 21. Other officers include Dr. Ralph E. Davis, Boise, vice president, and Joseph M. Thomas, Meridian, secretary-treasurer. Capt. Norman L. Murray, M. C., A. U. S., discussed "Office Management of the Diabetic."——Dr. William C. Smail, Jerome, addressed a recent meeting of the South Side Medical Society in Jerome on "Dyspareunia."

ILLINOIS

Personal.—Dr. Josiah J. Moore, Chicago, has been appointed a member of the professional committee for medicine of the state department of registration and education, succeeding the late Dr. Arthur H. Geiger, who died May 12.——Dr. Edward J. McNulty on November 1 was named health officer of LeRoy.

Outbreak of Influenza.—A total of 2,600 persons were reported ill with influenza in Waukegan and North Chicago December 2. Newspapers reported that the outbreak was mild and that schools and factories had not been ordered closed. Persons feeling the symptoms of grip or influenza were urged to remain in bed. At Loyola Academy, Chicago, 100 of 600 students were absent December 2 because of the illness. Seven of twenty-five faculty members were also ill. The school was to stay closed for a number of days.

Chicago

Course in Hospital Administration at Northwestern.—The Johnson and Johnson Research Foundation, New Brunswick, N. J., recently made a grant to Northwestern University Medical School to assist in making possible a special course in hospital administration. Students enrolled in the course represent nineteen different hospitals. Of eight students not connected with a hospital, two are employed on hospital magazines, two are physicians, one is director of a hospital council and one is employed by the American College of Surgeons.

Research Fellowships.—Applications for research fellowships in medicine, dentistry and pharmacy in the University of Illinois are now being considered for the year beginning Sept. 1, 1944. Appointments to these fellowships will be announced on January 1. Candidates for these fellowships must have completed a training of not less than eight years beyond high school graduation. The fellowship carries a stipend of $1,200 per calendar year with one month's vacation. Application blanks and further information may be secured from William H. Welker, Ph.D., secretary of the committee on graduate work in medicine, dentistry and pharmacy, 1853 West Polk Street, Chicago 12.

Changes in the Faculty at Illinois.—The University of Illinois College of Medicine announces the following recent appointments to the faculty:

Dr. Hugh Thompson Carmichael to associate professor of psychiatry.
Dr. Dean A. Collins to associate professor of physiology.
Dr. Harry S. Gradle to professor of ophthalmology, also director of the Illinois Eye and Ear Infirmary.
Dr. Richard L. Jenkins to assistant professor of criminology, social hygiene and medical jurisprudence.
Dr. Peter C. Kronfeld to associate professor of ophthalmology, also director of education (eye) in the Illinois Eye and Ear Infirmary.
Lawrence J. Linck, M.S., lecturer in public administration in the department of criminology, social hygiene and medical jurisprudence, also director of the division of services for crippled children.
Dr. Ladislas J. Meduna to associate professor of psychiatry.
Howard J. Shaughnessy, Ph.D., to associate professor of bacteriology and public health.
Beatrice D. Wade, O.T.R., associate professor and director of occupational therapy.

Governor's Conference on Exceptional Children.—The second annual Governor's Conference on Exceptional Children will be held at the La Salle Hotel, December 13, under the auspices of the Commission for Handicapped Children. Gov. Dwight H. Green will address the session on "The Handicapped —A Challenge to Us All." Among the speakers on the program will be:

Mrs. Walter M. Rennie, president, Illinois Federation of Women's Clubs, Legislation for Handicapped Children.
Charles Scott Berry, Ph.D., director of special and adult education, Ohio State University, Columbus, The Gifted Child—An Undeveloped State Resource.
Mr. Alden B. Mills, vice president, Illinois Association of School Boards, Where Do We Go From Here?

Group meetings will feature sessions the first day on "The Development and Utilization of the Potentialities of Handicapped Children Through Education, Health, Employment and Welfare. Other speakers will include Dr. Roland R. Cross, Springfield, state director of public health, Rodney H. Brandon, Springfield, state director of public welfare, Dr. Meyer A. Perlstein, member of the attending staff of Cook County Hospital, and Dr. Raymond B. Allen, dean, University of Illinois College of Medicine.

Dr. Aldrich to Direct New Pediatric Project at Mayo Clinic.—Dr. Charles Anderson Aldrich, physician-in-chief at the Children's Memorial Hospital and professor of pediatrics at Northwestern University Medical School, has been named to organize and direct a long term research program in preventive medicine in childhood at the University of Minnesota Graduate School, Minneapolis-Rochester. The project will be financed by the Mayo Clinic and will be carried out in cooperation with Dr. Henry F. Helmholz, Rochester, Minn., in charge of the department of pediatrics at the clinic. It is planned to begin the preventive medicine program with antepartum and newborn care, the children in older age groups to be reached as the project expands. Initially the plan will be confined to the city of Rochester. Dr. Stanley Gibson, professor of pediatrics at Northwestern and a member of the staff of Children's Memorial Hospital for twenty-two years, will succeed Dr. Aldrich as physician-in-chief at Children's Memorial Hospital, and Dr. John A. Bigler will become assistant physician-in-chief and medical director. All changes will be effective January 1. Dr. Aldrich graduated at Northwestern in 1915. Secretary of the American Board of Pediatrics, he has been associated with Children's Memorial Hospital since 1921 and with Northwestern since 1934.

LOUISIANA

University News.—On December 20 Dr. Reginald Fitz, assistant to the dean, Harvard Medical School, Boston, will deliver the commencement address at the Louisiana State University School of Medicine, New Orleans. The exercises will close the March-December 1943 school year, at which 77 seniors will receive the degree of doctor of medicine. Of these, 38 are affiliated with the army specialized training unit number 3876 and 20 with the navy specialized training unit. Nineteen are civilians. The new school year will open on January 3.

MARYLAND

Dr. Davis Named Director of Communicable Diseases.—Dr. Joseph W. Davis, Fairmont, W. Va., for six years health officer of Marion County, W. Va., has been appointed director of the bureau of communicable diseases in the Baltimore City Department of Health, effective December 1, filling the vacancy left when Dr. David H. Andrew, Baltimore, resigned to enter private practice.

Institute on the Exceptional Child.—"Psychotherapy for the Exceptional Child" was the theme of the tenth Institute on the Exceptional Child at the Belvedere Hotel, Baltimore, November 9. Among the speakers were:

Dr. John C. Whitehorn, Baltimore, chairman.
Dr. George H. Preston, Baltimore, Common Factors in Mental Health.
Dr. Alice E. Rockwell, Baltimore, Therapy for Mothers Runs Parallel with Treatment of Children.
Dr. Jacob H. Conn, Baltimore, Play Therapy—The Method of the Play Interview.
Harry F. Latshaw, Baltimore, School Aspects of Psychotherapy.
Drs. Leo Kanner and Trude Tietze, Baltimore, Psychotherapy for the Parents of Retarded Children.
Dr. Leslie B. Hohman, Baltimore, Some Further Aspects of the Parental Problem.

Vesalius Anniversary Celebration.—The Johns Hopkins Medical History Club commemorated the four hundredth anniversary of the publication of Andreas Vesalius's De Humani Corporis Fabrica Libri Septem on November 1 in the lecture hall of the Institute of the History of Medicine, Baltimore. The following program was presented:

Dr. George W. Corner, Baltimore, Andreas Vesalius in the History of Anatomy.
Dr. Gregory Zilboorg, New York, Psychological Sidelights on Andreas Vesalius.
Ludwig Edelstein, Ph.D., Baltimore, Andreas Vesalius the Humanist.
Dr. Owsei Temkin and William L. Straus Jr., Ph.D., Baltimore, Some Aspects of the Anatomical Material of Vesalius.
Dr. Henry E. Sigerist, Baltimore, Albanus Torinus and the German Edition of the Epitome.

MICHIGAN

Sanatorium Named for Physician.—The board of supervisors on October 22 officially changed the name of the Calhoun County Public Hospital, Battle Creek, to the Arthur S. Kimball Sanatorium, in honor of the late Dr. Kimball, who was instrumental in establishing the institution in 1921 for the treatment of tuberculous patients. Dr. Kimball died in 1921 at the age of 42.

Acting Director Chosen for New County Health Department.—Dr. Joseph G. Molner, deputy superintendent of the Detroit Department of Health, has been selected as the acting director of the newly organized Wayne County Department of Health on a part time basis (THE JOURNAL, May 29, p. 322, and June 12, p. 455). Newspapers report that the county board has sought unsuccessfully for several months to obtain a full time health officer.

Public Health Officers.—John M. Hepler, C.E., director of the bureau of engineering of the state department of health, Lansing, was inducted into the presidency of the Michigan Public Health Association at its annual meeting in Grand Rapids, November 4. Nathan Sinai, D.P.H., Ann Arbor, is the new president-elect. Dr. Hugh B. Robins, Marshall, director of the Calhoun County health dpartment, is vice president, and Miss Marjorie Delavan, Lansing, secretary-treasurer, reelected.

Site Chosen for Medical Center.—The board of education of Detroit on November 23 approved a site for the Wayne University Medical Science Center. The first unit, the Wayne University County Hospital, will occupy three blocks between Farnsworth and Theodore and running from Beaubien to Hastings streets together with one bounded by Frederick, St. Antoine, Farnsworth and Beaubien. In addition to these three blocks to be acquired immediately, the board recommended that the district bounded by Warren, Brush, Hastings and Ferry, with a gross area of 53 acres, be earmarked for the future development of the center. The utilization of this site will place the medical center's activities close enough to other university facilities to allow a functional integration as well as permitting the advantage of proximity to the hospitals on the east side of Woodward Avenue. Children's, Woman's, Harper and Grace hospitals, now affiliated with the Wayne University College of Medicine, are within walking distance of the planned site. When completed, the fifty million dollar project will include five main buildings as well as a number of service units. In addition to the university hospital, the construction of which is first on the list, the main buildings include the Hall of Medical Sciences, the Institute of Industrial and Public Health, the Center for Continuation Study and the Medical Science Library. The county hospital is to cost two million dollars and the Hall of Medical Sciences five million. Smith, Hinchman & Grylls have been chosen architects for the project.

MINNESOTA

Changes in Hospital Superintendents.—Dr. Stanley B. Lindley, assistant superintendent of the Fergus Falls State Hospital, Fergus Falls, has been appointed superintendent of the Willmar State Hospital, Willmar. The latter position has been vacant since the transfer of Dr. Magnus C. Petersen to Rochester.——Dr. Walter P. Gardner has resigned as superintendent of the Anoka State Hospital, Anoka, to return to private practice. Dr. Edmund W. Miller, assistant superintendent of the St. Peter State Hospital, St. Peter, has been named acting superintendent at Anoka.

Dr. Harrington to Retire as Health Commissioner.—Dr. Francis E. Harrington will retire as commissioner of health of the city of Minneapolis on June 19, 1944, when he reaches the legal retirement age in the city. Dr. Harrington is also acting superintendent of the Minneapolis General Hospital, including the Parkview Sanatorium and the Elizabeth Kenny Institute. Wallace D. Hunt, senior surgeon, U. S. Public Health Service Reserve, has been detailed by the surgeon general to assist the city of Minneapolis in the administration of public health. It is expected that he will remain in this status until July 1, 1944.

NEW YORK

Central Adirondacks Practically Free of Hay Fever.—The state department of health on December 5 announced that the central Adirondacks section of the state was practically free this year from ragweed and its pollen. During August and September pollen count survey stations were conducted in four places on the rim of the so-called ragweed free area in the counties of Herkimer, Hamilton and Franklin. The counts were so low that it is now generally believed that the free area has grown considerably, probably as the result of a long term program of weed elimination carried on by local counties and organizations interested in creating havens in the region for hay fever sufferers. The village of Old Forge, Herkimer County, was found to have a pollen index of zero, the first place to have this count in the six years the surveys have been made. In Speculator and Indian Lake, Hamilton County, there was no time during the fifty-one day survey that the pollen concentration was sufficiently high to cause hay fever symptoms. Loon Lake, Franklin County, had only five days which might be considered "hay fever days."

New York City

Harvey Lecture.—John Howard Mueller, Ph.D., professor of bacteriology and immunology, Harvard Medical School, Boston, will deliver the third Harvey Society Lecture of the current series at the New York Academy of Medicine, December 16. His subject will be "Nutrition of the Single Cell; Its Applications in Medical Bacteriology."

Friday Afternoon Lectures.—The New York Academy of Medicine opened its 1943-1944 Friday afternoon lecture series on November 5 with a talk by Dr. Stuart W. Harrington, Rochester, Minn., on "Diaphragmatic Hernia." Included in the series are the following:

Dr. Leonard Greenburg, Health Hazards in War Industry, November 12.
Dr. Harold M. Marvin, New Haven, Conn., The Treatment of Paroxysmal Tachycardia, November 19.
Dr. Ephraim Shorr, Endocrine Treatment of Menstrual Disorders, December 3.
Dr. Harold Thomas Hyman, New York, John F. Mahoney, Staten Island, N. Y., senior surgeon, U. S. Public Health Service, Recent Advances in the Treatment of Syphilis, Including the Use of Penicillin, December 10.
Dr. Maxwell Finland, Boston, A Review of Atypical Infections of the Respiratory Tract and Their Management, December 17.
Dr. David P. Barr, Recent Advances in Drug Therapy, January 7.
Dr. Homer F. Swift, Rheumatic Fever, January 14.
Dr. Philip D. Wilson, The Modern Conception of the Surgery of Amputation, January 21.
Dr. George T. Pack, L. Duncan Bulkley Lecture, Cancer of the Stomach, January 28.
Dr. Donovan J. McCune, Dwarfism, February 4.

Dr. Joseph H. Globus, Cerebrovascular Accident, February 18.
Dr. Alexander Randall, Philadelphia, Recent Advances in Knowledge Relating to the Formation, Recognition and Treatment of Kidney Calculi, February 25.
Dr. William P. Thompson, Hemorrhagic Diseases, March 3.
Dr. Franklin M. Hanger Jr., Present Day Views of Functional Liver Tests, March 10.
Dr. Alvan L. Barach, Physiologically Directed Therapy in Intractable Asthma, March 17.
Dr. Norman H. Jolliffe, Avitaminoses—Diagnosis and Principles of Treatment, March 24.
Dr. Howard C. Taylor Jr., Diagnosis and Treatment of Malignancy of Pelvic Organs, March 31.
Dr. Milton Benjamin Rosenbluth, Practical Management of Hypertension, April 7.
The Most Recent Methods in the Treatment of War Wounds and Surgical Shock, April 14, speaker to be announced.

OHIO

New Bureau of Maternal and Child Health.—The Toledo Board of Health on November 2 created a city bureau of maternal and child health. Dr. Louis E. Payne Jr., pediatrician on the board's tuberculosis control program, will, in addition to his regular work, serve as head of the new unit.

Twenty-Five Years as Head of Department of Physiology.—On November 18 associates and students of Dr. Carl J. Wiggers gave a dinner to honor him on his completion of twenty-five years as professor and head of the department of physiology at Western Reserve University School of Medicine, Cleveland. Dr. Torald Sollmann, dean of the medical school, presided. Dr. Wiggers, who graduated at the University of Michigan Medical School, Ann Arbor, in 1906, joined the physiology department at Western Reserve in 1913, serving as assistant professor of physiology. In 1918 he was named to his present position.

Advisory Committee to Coordinate Tuberculosis Programs.—Dr. Joseph B. Stocklen, controller of tuberculosis for Cuyahoga County, Cleveland, has been named chairman of the recently appointed advisory committee on coordination of tuberculosis programs (THE JOURNAL, February 6, p. 447). The executive committee of the Ohio Public Health Association provided for the creation of the committee at its May meeting but Dr. Charles A. Doan, Columbus, president of the association, only recently named its members. In addition to Dr. Stocklen, remaining members of the committee include Dr. Myron D. Miller, Columbus, Dr. William D. Hickerson, Cincinnati, Dr. Lorin E. Kerr Jr., Oberlin, Dr. Earl E. Kleinschmidt, Toledo, Dr. Clarence L. Hyde, Akron, Dr. Harold H. Brueckner, Lima, Dr. Lynne E. Baker, Dayton, and Delmar R. Serafy, Canton, W. K. Curfman, Cincinnati, and Charron G. Payne, Columbus. The first meeting of the committee was held in Columbus on December 2.

PENNSYLVANIA

Society Adopts Medical Bureau for Business Activities.—The Dauphin County Medical Society recently decided to let the Medical Bureau of Harrisburg serve as the central business office of the society. Secretarial and clerical activities will be carried on under the direction of the society's secretary. The decision will provide a permanent headquarters providing better opportunities for desirable public relations. The Medical Bureau of Harrisburg, of which John A. McGhee is executive director, hopes the new program will be adopted by other medical societies.

Regional Health Institutes.—On November 10 the state department of health held a regional health institute at Erie in cooperation with the city bureau of health and collaborating health agencies, the first in a series of twelve planned throughout the state. Dr. Alexander H. Stewart, Harrisburg, state secretary of health, addressed the first session. Included among the other speakers were:

Dr. John Moore, Harrisburg, Responsibilities of Health Departments in Cities and Smaller Communities to Meet the Problems of a Nation at War.
Ralph C. Williams, New York, senior surgeon, U. S. Public Health Service, the Relationship of Federal, State, Local Health Agencies in an Integrated Program.
Dr. Nels A. Nelson, Baltimore, The Development of Venereal Disease Control Programs in an Industrial Area.
Col. Crawford F. Sams, M. C., U. S. Army, War and the Migration of Tropical Diseases.
Dr. Charles Howard Marcy, Pittsburgh, How May We Hold the Gains and Secure Further Advances Toward the Control of Tuberculosis?
Dr. John R. Conover, Pittsburgh, Industrial Diseases and the War Effort.
Dr. Herbert T. Kelly, Philadelphia, Improving the Nutrition of All the People.
Dr. Stanley P. Reimann, Philadelphia, The Challenge to the School and College in the Health Field.
Mr. Austin J. White, Erie, The Press Looks at Public Health.

The second institute was conducted in Washington, November 17.

Scott Award to Veterinary Surgeon.—Otto Stader, V.M.D., veterinary surgeon, Ardmore, has been given the John Scott Award and prize of $1,000 by the board of directors of City Trusts of Philadelphia for the invention of the reduction and fixation bone splint. Dr. Stader at one time served as instructor in veterinary science at the University of Wisconsin, Madison, and in 1941-1942 was president of the American Animal Hospital Association. Recently he has been conducting demonstrations at various naval stations showing the application of his invention.

Philadelphia

Special Lectures.—Dr. Cyrus C. Sturgis, Ann Arbor, Mich., will address the Philadelphia County Medical Society and the College of Physicians of Philadelphia at a combined meeting, January 12, on "A Study of the Incidence of the Commoner Types of Anemia, Their Cause and Treatment." On February 2 Dr. John A. Toomey, Cleveland, will deliver the Nathan Lewis Hatfield Lecture of the College of Physicians on "Observations on the Treatment of Infantile Paralysis in the Acute Stage."——Dr. John P. Peters, John Slade Ely professor of medicine, Yale University School of Medicine, New Haven, presented the annual Alpha Omega Alpha Honor Lecture at the Hospital of the University of Pennsylvania, November 19. His subject was "A New Frame for Metabolism."

RHODE ISLAND

Personal.—Dr. Lucius C. Kingman, formerly president of the Rhode Island Medical Society, has been named a member of the board of hospital commissioners of Providence to fill the unexpired term of Dr. John M. Peters, resigned.——Dr. Peter F. Harrington, director of tuberculosis for the Providence Health Department, was recently elected chairman of the health division of the Providence Council of Social Agencies.——Dr. Joseph Marks, Central Falls, has been appointed school medical inspector to succeed Dr. Adolph R. V. Fenwick, resigned.

VERMONT

State Medical Election.—Dr. Frank J. Hurley, Bennington, was named president-elect of the Vermont State Medical Society at its meeting October 25 and Dr. Charles H. Swift, Rutland, was installed as president. Dr. Benjamin F. Cook, Rutland, is the secretary.

University News.—Dr. William J. Bruckner, New Haven, Conn., addressed the student body of the University of Vermont College of Medicine, Burlington, November 26, on "Medical Experiences in the South Pacific." Dr. Henry N. Harkins, Baltimore, discussed "Therapy of Burns" before the Osler Clinical Society, November 26.

VIRGINIA

Personal.—Dr. David L. Harrell Jr., superintendent of the Petersburg State Colony, Petersburg, has been appointed superintendent of the Western State Hospital at Staunton. He succeeds Dr. Joseph S. deJarnette, who has spent fifty-four years in the service of the state hospital system.

University News.—A. W. Hurd, former dean of Hamline University, St. Paul, has become a director of the bureau of educational research at the Medical College of Virginia, Richmond, under a grant from the general education board. *Southern Medicine and Surgery* reports that Dr. Hurd's first work will be to direct an experimental study of the curriculum of the school of nursing, beginning with an analysis of the science subjects nurses use in practice. Dr. Randolph H. Hoge, assistant professor of gynecology, has been appointed professor of gynecology at the medical school.——Dr. Walter Ansell Derrick, Charlottesville, has resigned as associate professor of pathology at the University of Virginia Department of Medicine, Charlottesville, to become director of the Kingston City Laboratory, Kingston, N. Y.

Course in Ophthalmology and Otolaryngology.—The Gill Memorial Eye, Ear and Throat Hospital, Roanoke, announces that it will hold its eighteenth annual spring graduate course in ophthalmology and otolaryngology beginning Monday, April 3. Among the participants will be Drs. Paul H. Holinger, Chicago, Anderson C. Hilding, Duluth, Minn., Major Isador Jerome Hauser, A. U. S., Moses H. Lurie, Boston, Beverly Douglas, Nashville, Tenn., Rear Admiral Ross T. McIntire, surgeon general, U. S. Navy, Thomas Parran, surgeon general of the U. S. Public Health Service, Albert D. Ruedemann, Cleveland, Harold F. Falls, Ann Arbor, Mich., Raymond G. Ingalls, Berlin, N. H., Milton L. Berliner, New York, David G. Cogan, Boston, Paul A. Chandler, Boston, Eugene M. Blake, New Haven, Conn., and James S. Shipman, Camden, N. J.

GENERAL

Reduction in Rabies Deaths.—There were 36 deaths from rabies reported for the entire United States in 1942, according to figures released by the Bureau of Census on November 16. The largest number of deaths from rabies in the last ten years was 80 in 1934.

Pediatric Board Reopens Group I.—The American Board of Pediatrics, at its recent annual meeting, decided to reopen Group I, which requires that an applicant shall have been specializing in pediatrics for ten years or more. Group I will be kept open until July 1, 1944. When the organization of the board was completed in January 1934, Group I of the three authorized groups was to be kept open until September 1936, after which date examination was required.

Dr. Cumming Receives Gorgas Award.—On October 22 the Gorgas Award of the Association of Military Surgeons of the United States was presented to Hugh S. Cumming, surgeon general, U. S. Public Health Service, retired, and at present director of the Pan American Sanitary Bureau. The award was founded in 1942 by John Wyeth and Company of Philadelphia and consists of a medal and scroll and $500. It is given each year to some member of the association who has made notable contribution to medical science of value to the military service.

Inter-American Conference for Professional Education in Public Health.—The Inter-American Conference for Professional Education in Public Health has been permanently organized. The first meeting was in the form of a conference of representatives of the schools of public health in the South, Central and North American countries at the University of Michigan School of Public Health, Ann Arbor, November 8-11 (THE JOURNAL, November 6, p. 646). The next meeting of the conference will be held in São Paulo, Brazil, in 1945. There are no officers designated, the sponsors of the conference being the Pan American Sanitary Bureau.

Mead Johnson Prizes.—At the meeting of the American Academy of Pediatrics in Chicago, November 6, the 1943 recipients of the Mead Johnson awards were announced. First prize of $500 went to Dr. Hattie E. Alexander, New York, for her work on "The Treatment of the H. Influenzae Infections," and second prize of $300 to Dr. Philip Levine, Newark, N. J., for his work on "Erythroblastosis Faetalis and the Rh Factor." At the meeting Dr. Joseph S. Wall, Washington, D. C., was named as president-elect of the academy and Dr. Franklin P. Gengenbach, Denver, was installed as president. Dr. Clifford G. Grulee, Evanston, Ill., was reelected secretary-treasurer.

Dr. L. N. Upjohn Relinquishes Presidency of Company.—Dr. Lawrence N. Upjohn, since 1930 president of the Upjohn Company, Kalamazoo, Mich., will on January 1 become chairman of the board of directors, relinquishing the presidency of the company. Donald S. Gilmore, vice president and general manager of the company, will become president. Dr. Everett Gifford Upjohn, who has been with the company since 1931 and is now medical director, will continue in the latter position in the new post of vice president. Harold S. Adams, Ph.D., who joined the company in 1926 and has been general superintendent, is vice president and director of production. Dr. Lawrence Upjohn has been with the company since 1904 and was for twenty-five years in charge of the New York office.

New Journal on Allergy.—The *Annals of Allergy*, published by the American College of Allergists, recently made its appearance. Dr. French K. Hansel, St. Louis, is editor-in-chief. The editorial board includes a staff of corresponding editors from fifteen foreign countries and the United States possessions and is composed of specialists who have made some personal contributions to the field as related to their own particular specialty, internists, otolaryngologists and ophthalmologists, pediatricians, dermatologists, gastroenterologists, immunologists, bacteriologists (mycologists), pharmacologists, biochemists, botanists, plant pathologists and others. The college was incorporated in November 1942, and its objectives are to supplement the work of existing allergy groups as well as to "emphasize and consider numerous phases of the subject heretofore overlooked." Dr. Frederick W. Wittich, Minneapolis, is secretary of the college.

Pharmaceutical Manufacturers' Award Goes to Work on Penicillin.—On December 13 the American Pharmaceutical Manufacturers' Association, at its meeting at the Waldorf-Astoria, New York, will present its annual scientific award in absentia to Dr. Alexander Fleming, professor of bacteriology, University of London, for his discovery of penicillin and to Dr. Howard Walter Florey, professor of pathology, Oxford University, for his study of penicillin. The presentation of the award will mark the opening of a two day session of the American Pharmaceutical Manufacturers' Association. Speakers will include:

Norman T. Kirk, surgeon general of the U. S. Army, Army War Medicine.
Warren F. Draper, assistant surgeon general, U. S. Public Health Service, Civilian War Medicine.
Dr. Chester S. Keefer, Boston, Research in War Medicine.
Dr. Oliver H. Perry Pepper, Philadelphia, Medicine In War and After.
Charles Thom, Ph.D., Washington, D. C., Mold Research in War Medicine.
Dr. George A. Harrop, New Brunswick, N. J., Pharmaceutical Development of War Medicine.
Lieut. Col. Howard F. Currie, M. C., U. S. Army, Army Medical Purchasing Office.
Lieut. Col. Ralph R. Patch, U. S. Army, War Manpower.
Major E. P. Platt, U. S. Army, Surplus Government Drug Stocks.
Wendell Berge, S. J. D., Washington, D. C., Significance of Anti-trust Law in Postwar Period.
Dr. Thomas A. McGoldrick, Brooklyn, N. Y., Problem of Essential Medical Care.
Mr. A. C. Nielsen, Chicago, War Impact on Drug Distribution.
Mr. Charles W. Dunn, New York, general counsel of the association, Postwar Observation.

Frequency of Stillbirths.—For over 100 babies born alive, 3 are stillbirths, according to the *Statistical Bulletin* of the Metropolitan Life Insurance Company, official records showing that there are about 75,000 stillbirths in a year in the United States, a much larger number than deaths from tuberculosis in the general population. The bulletin points out that in reality the number of stillbirths exceeds the official total because many are not reported. The report states that the frequency of stillbirths is least in the age period 20-29, in which childbearing is heavily concentrated, a fortunate circumstance because practically three fifths of all mothers are within these ten years of life, it was stated. Among women who are having their first baby at the age of 45 or over there are more than 13 stillbirths for every hundred live births. On the other hand the frequency of stillbirths is also high among women who have already had a large number of children. In discussing the situation the *Statistical Bulletin* points out that an adequate program of antepartum care for pregnant women in industry would be a valuable aid in saving lives, commenting that a number of industrial plants have already taken steps in this direction. The ratio of stillbirths to live births has been reduced by nearly a fifth in the past decade, but in the need for improvement it is pointed out that many stillbirths could be prevented by the adequate treatment of syphilitic mothers early in pregnancy, the estimate being that at least three fifths of these pregnancies end in stillbirth. The bulletin states that "while a number of stillbirths result from biological factors, such as the aging of the mother, there is no doubt that many arise out of causes amenable to control, and it should be possible to reduce the frequency of stillbirths by expanding and coordinating prenatal services. Many stillbirths in which the child's life is destroyed during labor could have been prevented by better obstetrical care."

LATIN AMERICA

Health Activities in Latin America.—As the result of a conference of interested health and other officials in June, the organization of a project in Brazil to care for the health of migratory workers in the Amazon region is under way. Hospitals will be maintained at Belem and Manaus, as the camps at other localities in the district would be too small to justify the establishment of medical posts. Not all the localities to which laborers are to be sent have been determined, but they are being chosen for their value from an agricultural point of view. The migrant camp at Coroata was discontinued during July and another camp established at Caxias because of greater transportation facilities available in the latter city. Medical districts were opened during June at Abaete, Oriximina, Labrea, Vila Seabra and Sena Madureira.

Exchange Fellowships.—Under a two way exchange fellowship program sponsored by the Institute of Inter-American Affairs in Washington, more than 30 United States doctors have received special training in tropical medicine at Central American hospitals, with 40 more to train before this phase of the program is completed. The program is providing 120 doctors from Bolivia, Brazil, Chile, Colombia, Costa Rica, Ecuador, El Salvador, Guatemala, Haiti, Honduras, Nicaragua, Panama, Paraguay, Peru and Venezuela, with the opportunity to complete specialized studies in the United States. Many have finished their training, others are now studying and more are to begin their work. The group is particularly interested in studying advanced technics in cancer, tuberculosis, venereal disease, nutrition, blood banks, heart disease, public health nursing and sanitary engineering. The Inter-American health and sanitation program resulted from recommendations made at the Conference of American Foreign Ministers in Rio de Janeiro in January 1942.

Quinine.—The Brazilian government is planting cinchona trees experimentally in the state of São Paulo and other mountainous areas in southern Brazil to develop an American supply of quinine. If the experiment is successful, large scale plantings will be carried out so that the Americas will never again have to depend on quinine from sources that might be cut off.

Personal.—Dr. Roberto Souza Coeh Coelho, director of the Pasteur Institute of Rio de Janeiro, is in the United States to spend a month of study at the Rockefeller Institute for Medical Research, New York, after which he will pursue work in Washington and Montgomery, Ala., where studies on hydrophobia are being made.——Dr. Charles E. Shepard has been named chief of the personnel training and health education section, a new division of the Health and Sanitation Division brought about by combining health education activities in the special activities section with those of the personnel training section.——Dr. Guillermo C. Paterson, Buenos Aires, first president of the Jujuy Branch of the Sociedad Argentina de Pathología Regional, recently completed fifty years in the practice of medicine, all of which have been spent in Argentina.——Dr. George Brecher, formerly of Olomouc, Czechoslovakia, and recently a fellow in pathology at the Mayo Clinic, Rochester, Minn., will engage in public health service in Haiti, with residence in Port-au-Prince, under the joint auspices of the Haitian and United States governments.

Yaws.—A new health program has been undertaken in Haiti designed for the control and elimination of yaws. The project includes a new clinic at Jacmel, where as many as 1,700 patients have been treated in a single day. Some of the patients walked 20 miles to obtain attention from the 12 Haitian physicians and nurses who staff the clinic. Dr. James H. Dwindelle, specialist in skin diseases, has been assigned by the Health and Sanitation Division to cooperate with Haitian authorities in combating the disease. It is hoped to control yaws in the areas around Gressier and Jacmel before starting similar programs in such zones as Marigot, Saltrou and Grand-Gosier.

Malaria.—The first permanent malaria control project in Honduras was started on April 15, 1942 in Choluteca, this city being chosen because of its important location on the Pan American Highway. In addition a number of temporary control projects have been instituted in Tegucigalpa, Amapala and Trujillo.

New Construction.—In Honduras new construction includes health centers in Tegucigalpa and Choluteca, serving respectively populations of 50,000 and 5,000.——A new cancer clinic was opened in Guadalajara, Mexico, during the first Mexican Cancer Congress, held there recently. A recommendation for the organization of a National Institute of Cancer was made at the congress, as was the announcement that a nationwide drive against the disease would be started.

Nursing.—A general program has been instituted throughout Latin America, including the building up of service, the provision of fellowships and nursing education. In Brazil a new school of nursing will be established in São Paulo to work in connection with the faculty of medicine and the new 1,200 bed hospital De Clinicas, under the supervision of the São Paulo state government. Nurses' residences, classrooms and laboratories will be constructed. Equipment and installation for the buildings will be provided by the public health department of the state of São Paulo, and the Rockefeller Foundation has undertaken supervision of the curriculum and course of studies. Thirty-seven students have been enrolled for the first class, the majority of whom are normal school graduates. The recruitment of students is being undertaken in other parts of Brazil to fill the first class to its capacity of ninety students. Thirty scholarships have been provided. A new national school of nursing has been established in Bogota, Colombia, by presidential decree, to be an entity within the Ministry of Labor, Hygiene and Social Welfare. It is expected that this project will be completed in 1945. A remodeled ministry building, to be available in 1944, will temporarily house the fifty first year students. A national school for nurses was set up in Quito, Ecuador, in 1942, and the development of an existing school in San Salvador, El Salvador, is under way.

Society News.—The second Mexican Congress of Pediatrics will be held in Mexico, D. F., March 26-April 1, 1944. Officers are Drs. Mario Torrella, Federico Gomez S. and Hermilo L. Castañeda, who are respectively president, vice president and secretary of the committee of organization. Topics to be discussed will include colitis in children, Mexican eutrophic children, hygiene and medicosocial care for rural children and the normal x-ray appearance of the thorax of Mexican children.——The first Peruvian Congress of Protection to Childhood took place in Lima during July.——The fifth Argentine Congress on Obstetrics and Gynecology was held in Buenos Aires, October 3-8. Among the speakers were Drs. Manuel Avilés, Chile, Emilio Argonz, Rosario, Mariao M. Fabiao, Rio de Janeiro, Alberto Peralta Ramos, Buenos Aires, Juan Pou Orfila, Montevideo, Humberto Dionisi of Córdoba, Claudio Goulard de Andrade, Rio de Janeiro, and Juan A. Salaber, Buenos Aires.——The seventh Argentine Congress of Medicine met at La Plata City, November 12-21. The session was divided into sections on neurology and psychiatry, legal medicine and toxicology, ophthalmology and general pathology and pathologic anatomy.

FOREIGN

Dr. Max Neuburger Observes Seventy-Fifth Birthday.—Dr. Max Neuburger, formerly professor of the history of medicine at the University of Vienna and since 1939 associated with the Wellcome Historical Medical Museum in London, observed his seventy-fifth birthday, December 8. Frequently referred to as dean of medical history, Dr. Neuburger was the founder of the Institute for Medical History and Museum at the University of Vienna.

Personal.—Dr. Harry Guy Dain, Birmingham, on September 23 was unanimously elected chairman of the Council of the British Medical Association, succeeding Dr. Henry S. Souttar, London (THE JOURNAL, February 13, p. 533).——Mr. H. H. Gerrans has been appointed secretary of the Royal Institute of Public Health and Hygiene, London. Mr. Gerrans is a fellow of the Chartered Institute of Secretaries.——Dr. Charles Singer, who recently retired, has been made professor emeritus of the history of medicine in the University of London.

Grant Enables Maltese Physicians to Study in England.—The Nuffield Foundation, London, has awarded grants to enable six Maltese physicians to take specialized training in Great Britain in tribute to the courage of the people of Malta. The physicians chosen will be trained for the positions of orthopedic or assistant orthopedic surgeon, radiologist, tuberculosis officer, medical officer for the civil prison and reformatory and two infant welfare officers. Grants will be tenable for a maximum period of two years and will amount to $1,600 a year for single and $2,400 for married physicians, plus traveling allowances. Recipients must return to the island at the end of their training.

Government Services

Portrait of Carl Voegtlin

At a recent meeting of the National Advisory Cancer Council a portrait of himself was presented to Carl Voegtlin, Ph.D., who recently resigned as director of the National Cancer Institute of the U. S. Public Health Service (THE JOURNAL, June 26, p. 631).

Public Health Service Reorganized

Thomas Parran, surgeon general of the U. S. Public Health Service, has announced the names of five persons to head the new bureaus and divisions set up through the reorganization of the U. S. Public Health Service by Congress November 11. The reorganization was authorized in the enactment of a bill (S. 400). Dr. Lewis R. Thompson, medical director serving in the surgeon general's office, has been named assistant surgeon general in charge of the new Bureau of States Services. Dr. Ralph C. Williams, formerly district director with headquarters in New York, has been named assistant surgeon general in charge of the new Bureau of Medical Services. Dr. Rolla E. Dyer, director of the National Institute of Health, Bethesda, Md., will in addition serve as assistant surgeon general in charge of the new Bureau of Scientific Research. John K. Hoskins, senior sanitary engineer, under the new setup will become chief of the division of sanitary engineering and William T. Wright Jr., D.D.S., chief of dental work in the Marine Hospital Division of the public health service, will become chief of the division of dentistry. All five will hold ranks comparable to an army brigadier general, it was announced. They have been in a grade comparable to a full colonel in the army. Mr. Hoskins is said to be the only nondoctor or dentist to hold a rank in the public health service comparable to brigadier general. S. 400 provides that the surgeon general of the public health service, under the supervision and direction of the Federal Security Administrator, is authorized and directed to assign to the Office of the Surgeon General, to the National Institute of Health and to the Bureau of Medical Services and the Bureau of States Services, the functions of the public health service and to establish within the office of the surgeon general and the other groups named, such divisions, sections and other units as may be required to perform their functions.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Oct. 30, 1943.

The Decline of Population

Prof. A. V. Hill, physiologist, has published a curve in the London *Times* showing an imminent decline in the population of England and Wales. For simplicity, statistics on women between the ages of 20 and 40 years are used; this provides a good index of the total number available for child bearing. The curve shows a maximum population of about 6¾ million such women now and a gradual fall to less than 5 million in 1970. Up to 1931 the actual numbers for the census years 1901 to 1931 are used. After that, estimates supplied by the Population Investigation Committee are taken. All the women shown in the projected curve up to 1963 have actually been born, and their numbers can be affected only by drastic alterations in death rate, emigration or immigration. Even for 1970, two thirds of them are already born. Therefore no change in the rate of reproduction which can reasonably be expected in the next seven years can affect the curve much up to 1970.

Professor Hill thinks that there is no evidence that physiologic fertility has altered significantly in the present century. A downward trend, increasingly apparent since 1900, is almost certainly due to a variety of other causes. The immediate cause, he thinks, may have been a general realization of the possibilities of birth control acting and reacting with a number of other factors such as social custom, economic and industrial conditions, housing and education. Some experts regard the downward trend as a passing phase and think that after 1965 it will be reversed. But, according to Professor Hill, they do not realize the momentum of these changes. The present slight rise in the birth rate is used to justify complacency, but it is mainly due to abnormal causes such as younger marriages anticipating future births, the emotional influence of the war and others of a similar nature.

For the maintenance of our population, Professor Hill prescribes three things: (1) a keener and more generous recognition of motherhood as an honorable duty and occupation, (2) adequate children's allowances and (3) the deliberate introduction in all impending social, industrial, housing and educational programs of a definite bias in favor of happier, healthier and more efficient mothers and more and better children. Thus, he believes, though we cannot prevent the fall in population indicated in the curve to 1965, we may make the curve turn upward after that.

The Efficiency of the Army Medical Service

The war correspondent of the *Daily Telegraph*, Douglas Williams, assures relatives of men serving in the Mediterranean area that nothing has been left undone in the care of the sick and wounded and that no expeditionary force has ever had such good medical protection. The contrast with the last war is remarkable. Of 400 operations performed recently in a battle zone after a beach assault, less than 1 per cent proved fatal. At base hospitals the mortality has fallen as low as 1 or 2 per thousand, compared with 5 to 10 per cent in the last war. Malaria is prevalent, especially in Sicily and Italy at this time of year, and has caused much sickness, but atabrine has reduced the mortality in some areas by as much as 70 per cent. Apart from this inevitable incidence of malaria, no field force has ever been healthier. Inoculation has produced immunity to tetanus, typhoid and typhus. Increasing use is being made of penicillin, which is giving astonishing results in the treatment of wounds and septicemia. A recent example was a badly wounded, delirious soldier who arrived in Algiers by air from Italy. The penicillin team was immediately summoned by air from 300 miles away, and the man was about again in a fortnight.

Directing the medical service is Major Gen. E. M. Cowell, with Brig. Gen. Fred Blesse of the United States Army. In the combined and perfectly coordinated Anglo-American hospital organization no distinction is made as to nationality of patients. So well are the medical services organized close to the fighting line that almost as soon as a man has fallen medical care of some kind is available. In beach landings, tents staffed with surgeons arise like magic literally at the cannon's mouth. Blood transfusion is now brought up to the front line. In recent fighting many lives were saved by trained teams crawling forward to wounded men isolated in the battle area and administering transfusion on the spot. Supplemented by immediate surgery and rapid evacuation by air back to base hospitals, such methods have achieved wonders in forward areas.

So far this year nearly 50,000 sick and wounded have been evacuated from the battle zones over an average distance of 300 miles. From one air field alone 5,000 cases have been flown across the sea. Both the British and the United States armies maintain air evacuation units comprising doctors and nurses who accompany the men during the flight. Such aircraft are fitted as miniature hospitals, affording facilities for administering morphine, changing dressings and feeding patients. Entire field ambulance units equivalent to mobile field hospitals are also air borne, some even carrying jeeps fitted with stretchers. Parachute attacks are accompanied by surgeons and anesthetists who have passed special parachute courses. Mobile surgical teams composed of tough young specialists operate in advanced areas as far forward as possible. The supply of surgeons is much better than in the last war. There is one surgical team for every 2,000 fighting men. Side by side with the doctors, British and American nursing officers are doing magnificent work. In the Oran assault American nurses went ashore under fire and were splendid examples of courage.

The British Journal of Industrial Medicine

The *British Medical Journal* announces the publication commencing next January of an addition to the specialist journals published by the British Medical Association—the *British Journal of Industrial Medicine*. The project has often been discussed in recent years, and the final stimulus to action came in the shape of a formal request to the British Medical Association from the Association of Industrial Medical Officers. An editorial board was formed, and it was intended that Sir Henry Bashford, chief medical officer of the post office, would be editor in chief, but his recent appointment as medical adviser to the treasury prevents this. It is anticipated that Dr. Donald Hunter of the London Hospital will take his place. The other editors will be Dr. A. J. Amor, Dr. M. W. Goldblatt, Dr. D. C. Norris, Dr. Donald Stewart and Mr. R. W. Watson-Jones, a surgeon. The *British Medical Journal* says that since 1939 the country has been overwhelmingly conscious of the extent to which it owes its safety to the health of the worker in industry. Industrial medicine is not just industrial toxicology; in fact, this is but a small part of it. A whole range of problems face the worker, the management and the doctor—the effect on the worker and his work of temperature and humidity, of the intensity and direction of illumination, of posture and change of posture, of rest pauses and recreation, of washing facilities, of canteens and of an efficient accident service. There are also the important psychologic problems of monotony, relations between foreman and worker, selection of work and so on. From industrial medicine a steady flow of observation and research is hoped for, and much of this should find an outlet in the *British Journal of Industrial Medicine*.

BUENOS AIRES

(From Our Regular Correspondent)

Oct. 15, 1943.

Maternal Mortality

Dr. Carlos Roust recently reported the results of his studies on maternal mortality for the period 1901-1940 in the maternity ward of the Eliseo Cantón clinic. There were 821 deaths out of the whole group of 61,684 deliveries. In 642 cases (78.19 per cent) death was due to obstetric causes. In 179 cases (21.8 per cent) it was the result of intercurrent diseases. Maternal mortality due to obstetric causes diminished from 22.16 per thousand in the decade 1901-1910 to 5.6 per thousand in the decade 1931-1940. The mortality from various causes in the first and fourth decades of the period were as follows: from infection following abortion and peritonitis following cesarean section, 6.17 per thousand in the first decade and 2.82 per thousand in the fourth; from puerperal infection, 2.53 in the first and 1.14 per thousand in the fourth decade. The main causal factor was toxemia in 85.71 per cent of all the cases. Hemorrhage, obstetric trauma and infection followed toxemia in order of importance. Nationality, living conditions and occupation had no relation to maternal mortality. Factors found to be important were the health and cultural level of the mother, incomplete pelvic presentation and infection from premature rupture of the membranes. About half the deaths occurred in primiparas, especially older primiparas. In the group of mothers who died, pregnancy was pathologic in 40.94 per cent of the cases and normal in 16 per cent of the cases.

The number of deaths among women with breech presentation diminished over the period. Artificial rupture of the membranes did not cause infection. There was a definite relationship between dystocia and surgical interventions and maternal mortality. Prolonged parturition was found to be dangerous for the mother. The safest delivery for mothers, it was found, is that of normal duration. In cases of death from obstetric causes after delivery and during the puerperium, septicemia was observed in 46.55 per cent of the cases, toxemia in 19.18 per cent, trauma or shock in 19.18 per cent and obstetric anemia in 14.52 per cent. Death occurred during the puerperium in 90.03 per cent of the cases, during pregnancy in 4.36 per cent and during delivery in 5.6 per cent. Hemorrhage, shock or acute trauma during the first twenty-four hours following delivery were the most frequent causes of death after delivery or during the puerperium. Death from toxemia occurred, as a rule, within the first three days after delivery. Both maternal mortality and mortinatality diminished during the four decades. The intercurrent diseases which caused death during pregnancy and puerperium were, in order of importance, acute pulmonary diseases, heart diseases, tuberculosis, diseases of the kidneys, acute peritonitis due to appendicitis, cancer and diseases of the liver.

Brief Items

Scientific exchange courses between the United States and Argentina are being continued. Dr. Oscar Ivanisevich, head of the surgical clinic of the Faculty of Medicine of Buenos Aires, will give his course in the surgical clinic at Stanford University in California, and Dr. Leon Eloesser, head of the Stanford clinic, will give his in the Buenos Aires clinic and in the Instituto de Clinical Quirúrgica del Hospital de Clínicas.

Two complete units of plastic surgery and anesthesia equipment were presented to the Institute of Clinical Surgery of the Faculty of Medicine of Buenos Aires by the British Council of London as a result of a suggestion from Sir Harold Gillies, who visited Buenos Aires in 1941.

The first Inter-American Congress was recently held in Buenos Aires. Dr. José J. Merlo was the president. The following topics were discussed: Roentgenologic Diagnosis of Diseases of the Spine, Therapy and Result of Cancer of Breast, Roentgenologic Diagnosis of Intestinal Diseases and Teaching Roentgenology in the United States.

AUSTRALIA

(From Our Regular Correspondent)

Aug. 2, 1943 (delayed).

Quinine Sensitivity

Troops serving in malarious areas are given quinine as a routine suppressive measure, the dose being from 5 to 10 grains (0.32 to 0.65 Gm.) of quinine bisulfate, depending on the malarial incidence in the area of service. Captain W. M. Rose (A. A. M. C.) describes 2 cases of quinine sensitivity, which is apparently rare. Each subject showed a local sensitization characterized by painful micturition, swelling of the penis and scrotum, and an erythematous eruption which was confined to the trunk and proximal portions of the extremities. The symptoms disappeared when the ingestion of quinine was discontinued. Neither patient had been in the tropics previously nor could either recall having taken quinine orally, but each man gave a history of a well defined local reaction following the use of contraceptive pessaries by his wife. On his coming into contact with the drug again the penis was the first part to be affected.

Compulsory Chest Radiography to be Universal

It is probable that after the war compulsory radiographic examinations will be carried out on every Australian. This is one of the objectives under the social service health scheme now being prepared by the federal government for introduction later this year. Universal tests on the population are impossible during the war because of the shortage of radiologists and equipment. The government plans, however, to take over the radiographic equipment now being used by the army as soon as there is no further need for it for military purposes. The federal health minister (Mr. Holloway) hoped to make a start with school children, because medical experts considered that tuberculosis could be gradually eradicated if caught early. The health scheme should also include a separate pensions plan to maintain families of tuberculous bread winners so that family worries would not retard recovery.

Relief for Civilian Medical Men

Wartime exigencies have placed a heavy strain on the civilian medical profession, and many doctors have found it impossible to take a badly needed rest because of the difficulty of obtaining a substitute. A welcome announcement in this connection was made recently by the air minister, Mr. Drakeford, to the effect that, where they could conveniently be spared from the service, Royal Australian Air Force officers would act as substitutes for civilian practitioners for periods up to fourteen days, or longer in special cases. The medical officers detailed for such duties would be selected according to the type of practice requiring relief, and allocations would be made from the most conveniently situated units to reduce traveling to a minimum. It seems likely that the scheme could be applied to a number of units of the fighting forces when doctors have to be on the strength of the units to meet active service conditions but could be spared for limited periods to render valuable assistance by relieving men in civilian practice.

Marriages

ARTHUR LANKFORD JR., Rochester, N. Y., to Miss Harriet Campbell Whitehurst of Washington, D. C., November 16.

GEORGE B. SHARBAUGH, Statesville, N. C., to Miss Marie Field of Allentown, N. J., in Trenton, N. J., October 16.

THOMAS SPARROW LONG, Washington, N. C., to Miss Betty Martin Knox at Camp Bowie, Texas, August 14.

WILLIAM CLINTON MARETT JR., Seneca, S. C., to Miss Dorothy Henrietta Macaulay of Columbia recently.

RODERICK C. WEBB, Jackson, Tenn., to Miss Martha B. Jaco of Booneville, Miss., May 29.

Deaths

Walter Wooten Council, Juneau, Alaska; University of Virginia Department of Medicine, Charlottesville, 1905; commissioner of health, Alaska Territorial Department of Health since 1933; secretary-treasurer of the Alaska Board of Medical Examiners; member of the Territorial Medical Association and past president; member of the American Child Health Association and the American committee, International Congress of Industrial Accidents and Diseases; formerly vice president of the Conference of State and Provincial Health Authorities of North America; surgeon for the Copper River Railway and the Kennicott Copper Corporation, Cordova, Alaska, from 1911 to 1927; assistant surgeon, U. S. Public Health Service, from 1916 to 1927; formerly mayor of Cordova; at one time superintendent of the Cordova General Hospital; formerly president of the chamber of commerce; died November 13, aged 61.

John Hahn Pratt ✠ Manchester, N. Y.; Bellevue Hospital Medical College, New York, 1890; past president of the Ontario County Medical Society and the Seventh District Medical Society; recently a member of the Selective Service Board; examining physician for the eastern half of Ontario County during World War I; for many years a member of the board of education; vice president of the Frederick Ferris Thompson Hospital, Canandaigua, where he was a member of the attending staff; for many years a member and chairman of the board of directors of the Ontario County Trust Company and physician and surgeon for the Lehigh Valley Railroad; a director of the State Bank of Shortsville; died September 21, aged 78, of cardiovascular disease.

William Robert Whiteis ✠ Iowa City; State University of Iowa College of Medicine, Iowa City, 1895; formerly assistant professor of histology, professor of histology and embryology, and clinical assistant to the chair of otology, rhinology and laryngology, professor of histology and embryology and assistant professor of gynecology, professor of obstetrics, professor of obstetrics and gynecology and head of the department and professor emeritus at his alma mater; at one time director of the University Hospital and past president of the staff; on the staff of the Mercy Hospital; member of the Rotary Club; died September 3, aged 74, of coronary occlusion.

Andrew Raymond Amos, Beverly Hills, Calif.; Rush Medical College, Chicago, 1882; member of the Iowa State Medical Society; died September 17, aged 85.

Herbert Taylor Aydlett, Greensboro, N. C.; University of Virginia Department of Medicine, Charlottesville, 1894; member of the Medical Society of the State of North Carolina; died recently, aged 75.

Marvin Oliver Brice, Okemah, Okla. (licensed in Oklahoma under the Act of 1908); member of the Oklahoma State Medical Association; formerly a druggist in Castle; died in the Wesley Hospital, Oklahoma City, September 7, aged 68.

Amy Reams Davis, Georgetown, Ill.; Bennett Medical College, Chicago, 1915; died in the Lake View Hospital, Danville, September 28, aged 61, of chronic toxemia and chronic bronchitis.

George Kendal Dazey, Los Angeles; George Washington University School of Medicine, Washington, D. C., 1920; served on the staff of the Santa Monica Hospital; died in the Good Samaritan Hospital September 30, aged 48, of carcinoma of the left lung.

Henry Charles Mitchell De Wolfe, Braintree, Mass.; Dalhousie University Faculty of Medicine, Halifax, N. S., Canada, 1924; formerly associated with the U. S. Public Health Service; died in Boston September 1, aged 43.

Thomas Embelton Hays ✠ Burlington, Vt.; University of Vermont College of Medicine, Burlington, 1911; served on the staff of the Green Mountain Sanatorium; died in Boston recently aged 65.

Alfred Baker Hender, Davenport, Iowa; State University of Iowa College of Medicine, Iowa City, 1901; veteran of the Spanish American War; dean of the Palmer School of Chiropractic; died September 26, aged 69, of influenza complicated by bulbar paralysis.

Roy Elwin Hunt, Littlefield, Texas; University of Texas School of Medicine, Galveston, 1934; member of the State Medical Association of Texas; on the staff of the Littlefield Hospital and Clinic; was shot October 26, aged 36.

Henry M. Katz ✠ Cedarburg, Wis.; Wisconsin College of Physicians and Surgeons, Milwaukee, 1908; died in St. Mary's Hospital, Milwaukee, September 21, aged 59, of cachexia and carcinoma of the esophagus with perforation into the trachea.

Edward Kellner, New York; Medizinische Fakultät der Universität Wien, Austria, 1899; died in August, aged 69.

Edward Rush King, Ashdown, Ark.; University of Tennessee College of Medicine, Memphis, 1915; member of the Arkansas Medical Society; served during World War I; died September 24, aged 51, of cerebral hemorrhage due to hypertension.

Lawrence Victor Lee ✠ Lattimore, N. C.; Atlanta (Ga.) Medical College, 1894; member of the school board; died in the Shelby Hospital October 9, aged 72, of carcinoma of the stomach.

Harrison Arthur Longdon, Moberly, Mo.; Meharry Medical College, Nashville, Tenn., 1908; city physician; died September 23, aged 61, of tuberculosis.

Allen Walker Martin, Bogalusa, La.; University of Louisville (Ky.) Medical Department, 1907; member and formerly vice president of the Louisiana State Medical Society; secretary of the Washington Parish Medical Society; health officer of Bogalusa; coroner of Washington Parish for four years; on the staff of the Elizabeth Sullivan Memorial Hospital, where he died October 6, aged 61, of hypertension and cerebral hemorrhage.

Wayland Hogeboom Mason Jr., Norwich, N. Y.; University and Bellevue Hospital Medical College, New York, 1931; member of the Medical Society of the State of New York; died September 7, aged 41, of tuberculosis of the lungs.

William Ezra McCollom ✠ Brooklyn; Columbia University College of Physicians and Surgeons, New York, 1903; chief attending physician and past president of the medical board, St. Mary's Hospital; attending physician, Cumberland Hospital; died October 13, aged 63, of coronary thrombosis.

Howard Stephen Miller ✠ Taunton, Mass.; Middlesex College of Medicine and Surgery, Cambridge, 1922; died in Hollis, N. H., September 6, aged 55.

Robert Copeland Mooney ✠ Washington, D. C.; Albany (N. Y.) Medical College, 1908; member of the Medical Society of the State of New York; fellow of the American College of Physicians; heart and lung examiner in the medical corps of the U. S. Army during World War I; for many years served in the U. S. Public Health Service and Veterans Administration; medical consultant on the board of veterans' appeals; died in Worcester, N. Y., October 4, aged 60.

John Benjamin Morgan ✠ Cleveland; St. Louis University School of Medicine, 1910; member of the American Urological Association; vice chief of staff and director of urology, St. John's Hospital; died September 7, aged 55, of coronary thrombosis.

Saxton J. Morgan, Albany, Wis.; the Hahnemann Medical College and Hospital, Chicago, 1892; served as a member of the school board and board of health; president of the Bank of Albany; died September 13, aged 78, of cerebral hemorrhage.

Daniel Coleman Moseley, Faunsdale, Ala.; Medical College of Alabama, Mobile, 1888; member of the Medical Association of the State of Alabama; past president of the Marengo County Medical Society; formerly mayor of Faunsdale; died October 4, aged 76.

Dale Oliver Nugent, Centralia, Wash.; University of Tennessee College of Medicine, Memphis, 1912; member of the Washington State Medical Association; president of the Lewis County Medical Society; formerly mayor of Centralia and state senator; died in St. Vincent's Hospital, Portland, Ore., September 9, aged 59, of heart disease.

John D'Arcy O'Brien, Buffalo; University of Buffalo School of Medicine, 1904; member of the Medical Society of the State of New York; member of the child hygiene bureau, city department of health; on the staffs of Our Lady of Victory Hospital, Lackawanna, N. Y., and the Mercy Hospital; died September 16, aged 64, of coronary embolism.

William Monteith O'Bryan, Greelyville, S. C.; Medical College of the State of South Carolina, Charleston, 1911; died in the Kelley Memorial Hospital, Kingstree, September 30, aged 57, of acute nephritis.

Anton F. Ottrock, Detroit; Detroit College of Medicine and Surgery, 1932; member of the Michigan State Medical Society; member of the staffs of St. Francis Hospital, Hamtramck and St. Joseph's Mercy Hospital; died September 11, aged 36, of injuries received when he was struck by an automobile near New Baltimore, Mich.

Edwin H. Paff, Allentown, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1890; died September 16, aged 78, of aneurysm of the aorta.

Emory Madison Paine ✠ Grand Ledge, Mich.; Michigan College of Medicine and Surgery, Detroit, 1896; on the staff of St. Lawrence Hospital, where he died October 6, aged 77, of carcinoma of the stomach.

Joseph Oscar Paul, New Castle, Ind.; Medical College of Indiana, Indianapolis, 1905; died September 30, aged 62, of injuries received in an automobile accident.

Edward Robert Pelikan ✠ Senior Surgeon, U. S. Public Health Service, Portland, Maine; University of Nebraska College of Medicine, Omaha, 1925; served during World War I; medical officer in charge of the U. S. Marine Hospital, where he died October 2, aged 48, of myocardial infarction due to coronary thrombosis.

Frederick Leander Peterson ✠ Chewelah, Wash.; Northwestern University Medical School, Chicago, 1911; president of the Stevens County Medical Association; for many years treasurer of the Utah State Medical Association; a captain in the medical corps of the U. S. Army during World War I; formerly on the staffs of the Dr. W. H. Groves Latter-Day Saints Hospital and the Holy Cross Hospital, Salt Lake City; on the staff of St. Joseph's Hospital; died September 15, aged 64, of coronary embolism.

Frank Pike, Hoboken, N. J.; Southwest School of Medicine and Hospital, Kansas City, Mo., 1910; veteran of the Spanish-American War and World War I; formerly senior ship's surgeon for the Holland-American Line; died September 29, aged 67, of heart disease.

Andrew Jackson Plumer, Hysham, Mont.; Missouri Medical College, St. Louis, 1884; University of Pennsylvania Department of Medicine, Philadelphia, 1885; formerly a member of the house of representatives and state senate; died in Council Bluffs, Iowa, September 16, aged 80, of carcinoma of the stomach.

Thomas Austin Poole ✠ Washington, D. C.; Baltimore University School of Medicine, 1898; on the staff of the Episcopal Eye, Ear and Throat Hospital; died in the Central Dispensary and Emergency Hospital October 5, aged 69.

Wiley V. Powell, Ridgecrest, N. C.; University of Virginia Department of Medicine, Charlottesville, 1895; died in Morganton September 7, aged 75, of pneumonia.

Francis John Pursell ✠ Los Angeles; Long Island College Hospital, Brooklyn, 1899; veteran of the Spanish-American War; died September 16, aged 74, of lymphadenoma.

Alvah Ramsey, Norfolk, Va.; University College of Medicine, Richmond, 1899; for many years surgeon for the Norfolk and Western Railway; died in the Veterans Administration Facility, Kecoughtan, September 4, aged 66, of cirrhosis of the liver and heart disease.

Samuel Abram Riddick, Norfolk, Va.; University College of Medicine, Richmond, 1899; member of the Medical Society of Virginia; attending army surgeon at the port of embarkation, Newport News, from 1917 to 1919; on the staff of St. Vincent's Hospital; died September 9, aged 66, of tumor of the pancreas.

George Alexander Ritchie, Appleton, Wis.; Rush Medical College, Chicago, 1886; member of the State Medical Society of Wisconsin; on the executive staff of St. Elizabeth Hospital, where he died September 17, aged 85, of myocarditis.

Henry B. Robbins ✠ Jersey City, N. J.; University of Maryland School of Medicine, Baltimore, 1906; died September 7, aged 72, of carcinoma of the liver.

John Pierce Roberts, Punxsutawney, Pa.; College of Physicians and Surgeons, Baltimore, 1893; on the staff of the Locust Mountain State Hospital, Shenandoah; surgeon for the Susquehanna Coal Company; examiner for the New York Life Insurance Company and the Prudential Insurance Company; vice president of the First National Bank; died September 27, aged 75, of embolism and coronary thrombosis.

Benjamin O. Robinson ✠ Parkersburg, W. Va.; College of Physicians and Surgeons, Baltimore, 1904; past president of the West Virginia Public Health Council; fellow of the American College of Surgeons; for many years coroner of Wood County; on the staffs of the Camden-Clark Memorial and St. Joseph's hospitals; died October 4, aged 64, of coronary thrombosis.

Reuben Artman Robinson, Columbus, Ohio; State University of Iowa College of Medicine, Iowa City, 1903; veteran of the Spanish-American War; died September 19, aged 75, of coronary thrombosis.

Ned R. Rodes, Mexico, Mo.; Missouri Medical College, St. Louis, 1893; member of the Missouri State Medical Association; physician and surgeon for the Missouri Military Academy; company physician for the Chicago and Alton Railroad and the Chicago, Burlington and Quincy Railroad; on the staff of the Audrain Hospital, where he died September 18, aged 75, of cerebral thrombosis.

Harry Elmer Rowland, Johnstown, Ohio; Ohio Medical University, Columbus, 1901; member of the Ohio State Medical Association; died September 14, aged 72, of angina pectoris.

David Abram Rupert, Detroit; Medical Department of the Western University of Pennsylvania, Pittsburgh, 1907; died in October, aged 58.

Harold Melvin Sachs, Brooklyn; Temple University School of Medicine, Philadelphia, 1927; Long Island College Hospital, Brooklyn, 1929; member of the Medical Society of the State of New York; commissioned a captain in the medical corps, Army of the United States, June 26, 1942 and honorably discharged Aug. 27, 1943; died October 7, aged 42, of coronary thrombosis.

Thomas Morton Sankey, Wilkinsburg, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1902; member of the Medical Society of the State of Pennsylvania; died September 13, aged 66, of cerebral arteriosclerosis.

Ernst Gustav Sasse ✠ Lidgerwood, N. D.; Minneapolis College of Physicians and Surgeons, medical department of Hamline University, 1899; county physician and city health officer; a member of the Lions Club and junior chamber of commerce; died September 15, aged 73, of cardiovascular disease.

Harvey Wesley Saylor, Bruning, Neb.; Kansas City (Mo.) Medical College, 1897; member of the Nebraska State Medical Association; past president of the Thayer County Medical Society; member of the village board of trustees; formerly member of the county board of health; died in St. Joseph Hospital, Omaha, September 22, aged 71, of self-inflicted razor blade wounds.

Arthur Twing Schoonmaker, Westfield, Mass.; Hahnemann Medical College and Hospital of Philadelphia, 1894; served as a member of the local board of health; died August 30, aged 83.

Robert E. Sevier, Liberty, Mo.; University Medical College of Kansas City, 1890; member of the Missouri State Medical Association; formerly county coroner, county physician and health officer; died September 5, aged 83, of coronary occlusion.

De Witt Clinton Shaff, Clinton, Ind.; Rush Medical College, Chicago, 1907; member of the board of education for twenty-two years; died October 7, aged 74, of heart disease.

James Riddle Sharp, New York; University of Pennsylvania Department of Medicine, Philadelphia, 1890; member of the Medical Society of the State of New York; formerly visiting physician, outpatient departments, Presbyterian and Manhattan Eye and Ear hospitals; died in St. Luke's Hospital September 10, aged 76.

Cullom Sidwell, Celina, Tenn.; University of Tennessee College of Medicine, Nashville, 1908; examiner for the Selective Service Board and county health physician; chief of emergency medical service, Clay County Defense Council; died in St. Thomas Hospital, Nashville, September 29, aged 69, of heart disease.

Otis Franklin Simonds ✠ Cleveland; Medical School of Maine, Portland, 1909; member of the American Academy of Ophthalmology and Otolaryngology; on the staffs of the Lutheran and St. Luke's hospitals; died in the Lakewood (Ohio) Hospital September 26, aged 61, of coronary thrombosis.

C. A. Smith, Strafford, Vt.; University of Vermont College of Medicine, Burlington, 1895; died September 21, aged 78.

Jay LaVinne Smith, Norcatur, Kan.; University Medical College of Kansas City, Mo., 1913; on the staff of the Norton Hospital; died September 25, aged 53, of coronary thrombosis.

William Cullen Squier, Richmond, Ind.; Eclectic Medical Institute, Cincinnati, 1907; served during the Spanish-American War and World War I; major, medical reserve corps, U. S. Army, not on active duty; died September 1, aged 67, of myocarditis, arteriosclerosis and nephritis.

David Merner Staebler ✠ Hackensack, N. J.; University of Toronto Faculty of Medicine, Toronto, Ont., Canada, 1885; member of the Medical Society of the State of New York; formerly on the staffs of the Long Island College and Brooklyn hospitals, Brooklyn; died September 11, aged 86, of coronary occlusion and coronary sclerosis.

George Kellogg Stephens ✠ Newport, Ark.; Washington University School of Medicine, St. Louis, 1902; served on the city council and school board; died October 5, aged 64, of angina pectoris.

Olen Clarence Stephens ✠ Evansville, Ind.; University of Louisville (Ky.) Medical Department, 1915; served during World War I; formerly city physician; on the staffs of the Protestant Deaconess and St. Mary's hospitals; died September 13, aged 57, of coronary thrombosis.

Franklin Augustus Stevens ✠ Belmond, Iowa; University of Buffalo School of Medicine, 1890; anesthetist on the staff of the Belmond Hospital since 1918; died September 17, aged 79, of carcinoma of the colon.

Robert Cole Stickney, Beverly, Mass.; Columbia University College of Physicians and Surgeons, New York, 1919; member of the New England Pediatric Society; for many years chairman of the board of health of Beverly; member of the staffs of the North Shore Babies' Hospital, Salem, and the Beverly Hospital; died September 7, aged 48, of ventricular fibrillation.

Frank George Strayer, Oshkosh, Wis.; Marion-Sims College of Medicine, St. Louis, 1894; died September 15, aged 73.

Edwin Francis Sullivan, Gloucester, Mass.; Kentucky School of Medicine, Louisville, 1905; died in Boston, August 22, aged 63.

William Gordon Sutton, Sevensprings, N. C.; Jefferson Medical College of Philadelphia, 1889; member of the Medical Society of the State of North Carolina; past president of the Wayne County Medical Society; a member of the local school committee; died September 17, aged 82, of heart disease.

James Thomas Taylor, Greensboro, N. C.; University of Maryland School of Medicine, Baltimore, 1908; member of the Medical Society of the State of North Carolina; past president of the Guilford County Medical Society and the Eighth District Medical Society; formerly on the staff of St. Leo's Hospital; died September 27, aged 58, of carcinoma of the larynx.

William Haynes Teeter, Bristol, Va.; St. Louis College of Physicians and Surgeons, 1899; member of the Medical Society of Virginia; on the staff of King's Mountain Memorial Hospital; died October 1, aged 72, of nephritis.

Nathan Pulsifer Thayer, Brooklyn; Harvard Medical School, Boston, 1905; at one time medical superintendent of the Long Island Almshouse and Hospital, Boston; died in the Doctors Hospital, New York, September 18, aged 64.

Charles L. Thompson, York, Ohio; Ohio Medical University, Columbus, 1896; for many years president of the Mount Victory State Bank and the school board; instantly killed October 4, aged 72, when the automobile in which he was driving was struck by a train.

Clarence Victor Thompson, Burlingame, Calif.; Cooper Medical College, San Francisco, 1903; member of the California Medical Association; for many years chairman of the county board of supervisors; served as county health officer; on the staff of the Mills Memorial Hospital, San Mateo, where he died September 13, aged 62, of arteriosclerosis and coronary thrombosis.

Charles R. Truitt, Salisbury, Md.; University of Maryland School of Medicine, Baltimore, 1891; for many years jail physician and health officer of Wicomico County; died September 7, aged 75, of chronic myocarditis and chronic diffuse nephritis.

John Layton Tuttle, Clinton, Mich.; Jefferson Medical College of Philadelphia, 1899; died in Lansing, September 3, aged 67.

Edward Everett Twombly ✠ Colebrook, N. H.; Eclectic Medical College of Maine, Lewiston, Maine, 1885; died August 21, aged 83, of carcinoma of the stomach.

Earle Henry Tyson, Kansas City, Mo.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1900; died in St. Joseph's Hospital September 1, aged 69, of heart disease.

Hassow Otto von Wedel ✠ Ardsley, N. Y.; New York University College of Medicine, 1939; died October 10, aged 56, of a self-inflicted bullet wound.

David Frederick Waide, New Orleans; Louisville (Ky.) and Hospital Medical College, 1908; member of the Louisiana State Medical Society; secretary-treasurer of the Second District Medical Society; died in the Southern Baptist Hospital September 14, aged 60, of generalized peritonitis, acute dilatation of the heart, perforation of sigmoid and intestinal obstruction.

Aubrey Bradford Webster ✠ Philadelphia; Boston University School of Medicine, 1902; clinical professor of surgery at the Hahnemann Medical College and Hospital of Philadelphia; member of the founders group of the American Board of Surgery; fellow of the American College of Surgeons; chief surgeon at the Broad Street Hospital; on the staffs of St. Luke's and Hahnemann hospitals; died in Wynnewood, Pa., October 9, aged 67, of cerebral thrombosis.

William E. Weeks, New Orleans; Flint Medical College of New Orleans University, 1897; died in the Flint Goodridge Hospital of Dillard University September 5, aged 71.

Edwin B. Wells, North Lawrence, N. Y.; Albany Medical College, 1888; member of the Medical Society of the State of New York; died in the Potsdam Hospital October 4, aged 81, of coronary thrombosis.

Reinhardt Charles Wende ✠ Buffalo; University of Buffalo School of Medicine, 1924; diplomate of the National Board of Medical Examiners; served during World War I; on the staffs of the State Institute for Malignant Diseases and the Millard Fillmore Hospital; died October 15, aged 47, of acute pancreatitis.

COMDR. JAMES D. BLACKWOOD JR.
U. S. Navy, 1881-1942

Charles R. Wharton, Ruffin, N. C.; Medical College of Virginia, Richmond, 1897; for many years coroner of Rockingham County; chairman of the Ruffin township board of education; formerly county health officer; served as surgeon for the Southern Railway; died in the Memorial Hospital, Reidsville, September 19, aged 69, of injuries received in an automobile accident.

Herndon White, Baltimore; College of Physicians and Surgeons, Boston, 1907; served during World War I; died in the Johns Hopkins Hospital, Baltimore, September 8, aged 68.

Charles Forest Whiteshield ✠ Trout Creek, Mich.; Michigan College of Medicine and Surgery, Detroit, 1906; president of the Ontonagon County Medical Society; served during World War I; died in the Grand View Hospital, Ironwood, September 26, aged 80, of intestinal carcinoma.

Walter Burns Williams ✠ Argyle, Wis.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1897; village health officer; died September 4, aged 71, of angina pectoris.

Elza Levi Williamson, Calhoun, Ill.; Denver College of Medicine, 1900; past president of the Richland County Medical Society; for many years president of the village board; formerly a member of the board of education; died in Olney, September 12, aged 65, of myocarditis.

William A. Young, Springfield, Ill.; Washington University School of Medicine, St. Louis, 1892; member of the Illinois State Medical Society; on the staff of the Springfield Hospital, now known as the Memorial Hospital, where he was a member of the consulting staff; for many years surgeon for the Baltimore and Ohio, Illinois Central and Alton railroads; presented with the medal of the Illinois State Medical Society for fifty years practice; died October 6, aged 73, of heart disease.

KILLED IN ACTION

James Douglas Blackwood Jr. ✠ Medical Inspector, Commander, U. S. Navy, Drexel Hill, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1903; entered the U. S. Navy in December 1920; senior medical officer of the U. S. S. *Vincennes;* Blackwood Drive on the reservation of the new U. S. Naval Hospital, Dublin, Ga., named in his honor by the Bureau of Medicine and Surgery; a new navy vessel will also be named for him; was killed in action in the Solomon Islands Aug. 9, 1942, aged 60.

Correspondence

ADOPTION OF THE METRIC SYSTEM

To the Editor:—In the December 4 issue of THE JOURNAL was an article by the Council on Pharmacy and Chemistry on the use of the metric system. This is a most interesting article and I hope that it receives the attention it deserves. The metric system represents a standard which can be used and understood in every civilized country by every profession. It is one of the few scientific things that practically all professions can have in common.

As a civil engineer, I am in favor of the adoption in this country of the metric system in the engineering field. Experience in this and other systems, in this country and in Central and South America, has convinced me that a country as great as ours cannot cling much longer to "horse and buggy" standards, especially now that we are rapidly assuming a leading place in international affairs. China is undoubtedly severely handicapped in this respect by the language of its ancestors, and in the same way our engineers and scientists have been handicapped by our traditional standards of mensuration, perhaps without realizing this fact.

On his first assignment to work in a foreign country an engineer not trained in the metric system is usually somewhat appalled at the prospect of having to work and think in unfamiliar units. It was my experience that this difficulty was completely overcome within one month, and thereafter it became as natural to speak of 6 meter subway platforms, 30 centimeter beams, and the like, as if it were my natural habit of thought. Others who have had the same experience will testify to the ease of using only the metric system.

The main advantage of the decimal metric system for calculation and construction layout purposes is its simplicity. This results in saving of time, reduction of sources of error, ease of checking and a presentation which can be universally read and understood.

In the drafting room plans must be made and dimensioned in units suited to the degree of accuracy required. Structural steel details customarily, except for bridge work, show dimensions to 1/16 inch, as this tolerance is large enough to permit easy fabrication and small enough to insure accurate fit in the field. In metric work all structural steel is dimensioned in whole millimeters. Reinforced concrete details are customarily in this country dimensioned to the nearest 1/4 inch, as this tolerance represents a practical degree of accuracy for form construction. In metric work all reinforced concrete is dimensioned in whole centimeters. If a drawing bears a note to the effect that all dimensions are in millimeters (or centimeters, as the case may be) no further designation of units is required and all dimensions appear as whole numbers. Lines of dimensions can be added by machine or by inspection in far less time than would be required for foot, inch and fractional inch designations, and with a greatly reduced chance for error. Calculations of diagonals or hip and valley dimensioning are effected by the use of standard tables of logarithms, or even longhand, without recourse to special tables of logs and squares of foot and inch quantities. The chance of error through misreading of poorly written figures is reduced, as foot and inch marks are not used, and fractions are eliminated entirely. Drawing scales are greatly simplified. Those in most common use are 1 to 100, 1 to 50 and 1 to 20, the scale indicating directly the proportion of the representation on the drawing to the full-size object.

Estimating of quantities is materially facilitated, as conversion constants are generally powers of 10 and the necessity for recourse to handbooks thus greatly minimized.

In structural calculations involving weights of materials, the fact that a cubic decimeter of water weighs 1 kilogram and a cubic meter of water weighs 1 metric ton yields directly the unit weights of all materials, specific gravities known. Hydraulic calculations are a pleasure after one has wrestled with conversions of Imperial (or U. S.) gallons to cubic feet or vice versa.

In the field, surveyors and carpenters use the same units of measure for lines, grades and local measurements instead of constantly converting from feet and hundredths to inches and fractions, and back again. As a matter of fact, I have seen American engineers laying out complicated railroad work entirely in metric units without the slightest difficulty after a few days of adjustment to an entirely unfamiliar regimen.

Opposition to the adoption of the metric system on a universally compulsory basis has been vigorously presented by a small but effective minority ever since 1866, when the system was legalized in this country as an optional or permissive standard. A study of the nature of the testimony presented by the spokesmen for this vociferous group at hearings on the Britten bill in 1926 reveals, among other things, a tender solicitude [sic] on their part for the poor engineers, doctors and scientists who would be forced to recast their standards and modes of thought to the detriment of their professional efficiency. A study of the makeup of the opposition group, as far as identification of individuals has been possible, reveals a heavy proportion of business men, manufacturers and trade associations. Their arguments are not compatible with the common observation that engineers when forced to work in the metric system become such ardent partisans that it is difficult for them to give up its use.

In the next few years, opportunities for engineers to use only the metric system will increase. It is hoped that the question of compulsory metric standardization will again be brought to the fore. The engineering profession stands to gain as much as the medical profession from the general adoption of the metric system.

RICHARD JENNEY, C.E.,
1401 Arch Street,
Philadelphia.

USE OF FUADIN IN CREEPING ERUPTION

To the Editor.—In the November 13 issue of THE JOURNAL, page 694, Dr. D. C. Smith reported on the "Treatment of Creeping Eruption with Fuadin." He stated that in the 1 case which he treated the lesions had disappeared by the time the fifth injection (of 2 cc. each at daily intervals) had been given.

At the Station Hospital, Camp Livingston, Louisiana, we have an officer under treatment who was admitted on the 11th of October complaining of severely pruritic linear lesions (about 50 in number) on his trunk and extremities which had been present about ten days. He gave the history of having worked in the black soil under his home in Florida a short time before. A biopsy of one of the lesions revealed on serial section a cross section of one of the parasites, probably the dog and cat hookworm larva (Ancylostoma braziliense). On the 16th of October he began to receive injections of sodium antimony biscatechol (fuadin) intramuscularly. They were given three times a week, 5 cc. each time. A total of ten injections were given. It was

thought at first that the pruritus was decreased, but it later became evident that the injections were not preventing the further spread of the lesions. With a luer lock syringe several cubic centimeters of the solution was injected intracutaneously, producing a huge wheal at the advancing edge of several of the lesions. This too was without value.

Other treatments which were used and also found to be of doubtful value were intracutaneous injection of 1 : 5,000 mercury bichloride in procaine solution, local application of 10 per cent ammoniated mercury, intravenous injections of mapharsen 0.04 Gm. three times a week and occlusive dressings of ethyl acetate.

The best results were achieved by freezing a large area of skin surrounding the advancing edge of each lesion with ethyl chloride spray. However, this had to be repeated several times, and over the thick skin of the back the lesions were sprayed for as long as one minute forty-five seconds at a time.

It is hoped that this report of what is probably the second case of creeping eruption treated with fuadin will prevent any undue optimism in treating this stubborn disease.

HARVEY BLANK, First Lieutenant, M. C.,
Dermatology Section, Station Hospital,
Camp Livingston, Louisiana.

ULCERATION OF THE FEET FOLLOWING SINGLE APPLICATION OF CAMPHOR-PHENOL MIXTURE

To the Editor:—This is a report of another case of severe dermatitis of the feet with ulceration following the application of camphor-phenol mixture. This remedy, so ably popularized by Paul de Kruif, is still being used by the public on an "over the counter" basis with unfortunate results, as is illustrated by the following case:

A woman aged 30 was told that she had "ringworm of the feet" by her family physician. The eruption did not respond satisfactorily to the therapy prescribed by him on the first

Edema and ulceration of feet one week after single application of camphor-phenol mixture.

visit. On the advice of a "friend" she obtained "Phenolene," a camphor-phenol mixture prepared and sold "over the counter" at her local drug store.

She applied this preparation, which bore the usual warning signs "Poison" and "Do not apply to moist surfaces," to the interdigitate areas of both feet. By the following day the feet were swollen and painful. At the time of admission to the University Hospitals of Cleveland one week later there were bilateral edema and numerous deep ulcerations between all of the toes. These responded slowly to emollient local applications and rest in bed. The patient was in the hospital for thirteen days and totally disabled for twenty-seven or twenty-eight days.

Closeup of ulcerations.

Many work hours may be lost following ill advised applications of potent substances in the treatment of ordinary superficial mycosis of the feet.

WINTHROPE R. HUBLER, M.D., Cleveland.
From the service of Drs. Cole and Driver.

EARLY USE OF PENICILLIN (?)

To the Editor:—Undoubtedly most of us think of the use of penicillin in the treatment of infections as a very new thing, but perhaps the appended quotation may indicate that penicillin was used in the treatment of wounds three centuries or more ago, although the physicians of the period naturally did not distinguish one fungous growth from another.

For the last four generations there has been passed along in our family Theatrum Botanicum by John Parkinson, Apothecary of London and King's Herbarist. This very voluminous work was published in London in 1640. In the fourteenth tribe of plants in which are included "marsh, water and sea plants with mosses and mushrooms" we find the following among the descriptions of the various tree mosses:

"Muscus ex cranio humano.

"The Mosse upon dead mens Sculles. Let me here also adjoyne, this kind of mosse somewhat like unto the mosse of trees, and groweth upon the bare scalpes of men and women that have lyen long, and are kept in Charnell houses in divers Countries, which hath not onely beene in former times much accounted of, because it is rare and hardly gotten, but in our times much more set by, to make the Unguentuum Sympatheticum, which cureth wounds without locall application of salves, the composition whereof is put as a principall ingredient, but as Crollius hath it, it should be taken from the sculls of those that have beene hanged or executed for offences."

May it not well be that the alleged value of this moss as a wound dressing was due to the fact that in some instances the "moss" was a growth of penicillium notatum?

A. G. CRANCH, M.D.,
Union Carbide and Carbon Corporation,
New York.

Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

NATIONAL BOARD OF MEDICAL EXAMINERS EXAMINING BOARDS IN SPECIALTIES

Examinations of the National Board of Medical Examiners and Examining Boards in Specialties were published in THE JOURNAL, Dec. 4, page 928.

BOARDS OF MEDICAL EXAMINERS

ALABAMA: Montgomery, June 20-22. Sec., Dr. B. F. Austin, 519 Dexter Ave., Montgomery.

ARIZONA: * Phoenix, Jan. 4-5. Sec., Dr. J. H. Patterson, 826 Security Bldg., Phoenix.

COLORADO: * Denver, Jan. 5-7. Sec., Dr. J. B. Davis, 831 Republic Bldg., Denver.

DELAWARE: *Written.* Dover, Jan. 11-13. *Endorsement.* Dover, Jan. 18. Sec., Medical Council of Delaware, Dr. Joseph S. McDaniel, 229 S. State St., Dover.

GEORGIA: Atlanta, Dec. 21-22. Sec., State Examining Boards, Mr. R. C. Coleman, 111 State Capitol, Atlanta.

IDAHO: Boise, Jan. 11. Dir., Bureau of Occupational Licenses, Mrs. Lela D. Painter, 355 State Capitol Bldg., Boise.

ILLINOIS: Chicago, Jan. 18-20. Supt. of Registration, Department of Registration and Education, Mr. Philip Harman, Springfield.

INDIANA: Indianapolis, May 2-4. Sec., Board of Medical Registration and Examination, Dr. W. C. Moore, 301 State House, Indianapolis.

IOWA: * Iowa City, Dec. 27-29. Dir., Division of Licensure and Registration, Mr. H. W. Grefe, Capitol Bldg., Des Moines.

KANSAS: Kansas City, Feb. 2-3. Sec., Board of Medical Registration and Examination, Dr. J. F. Hassig, 905 N. Seventh St., Kansas City.

LOUISIANA: New Orleans, Dec. 21-23. Sec., Dr. R. B. Harrison, 1507 Hibernia Bank Bldg., New Orleans.

MARYLAND: *Medical.* Baltimore, Dec. 14-17. Sec., Dr. J. T. O'Mara, 1215 Cathedral St., Baltimore. *Homeopathic.* Baltimore, Dec. 14-15. Sec., Dr. J. A. Evans, 612 W. 40th St., Baltimore.

MICHIGAN: * Detroit, Dec. 20-22. Sec., Board of Registration in Medicine, Dr. J. E. McIntyre, 100 W. Allegan St., Lansing.

MINNESOTA: * Minneapolis, Dec. 20-22 and Jan. 18-20. Sec., Dr. J. F. DuBois, 230 Lowry Medical Arts Bldg., St. Paul.

MONTANA: Helena, April 3-5. Sec., Dr. O. G. Klein, First National Bank Bldg., Helena.

NEBRASKA: * Omaha, Dec. 21-23. Dir., Bureau of Examining Boards, Mr. Oscar F. Humble, 1009 State Capitol Bldg., Lincoln.

NEVADA: *Endorsement.* Carson City, Feb. 7, Sec., Dr. G. H. Ross, 215 N. Carson St., Carson City.

NEW HAMPSHIRE: Concord, March 9-10. Sec., Board of Registration in Medicine, Dr. D. G. Smith, State House, Concord.

NEW JERSEY: Feb. 15-16. Sec., Dr. E. S. Hallinger, 28 W. State St., Trenton.

NEW MEXICO: * Santa Fe, April 10-11. Sec., Dr. LeGrand Ward, 141 Palace Ave., Santa Fe.

NEW YORK: Albany, New York, Buffalo and Syracuse, Jan. 24-27. Sec., Dr. R. R. Hannon, Education Bldg., Albany.

NORTH CAROLINA: December. Sec., Dr. W. D. James, Hamlet.

NORTH DAKOTA: Grand Forks, Jan. 4-7. Sec., Dr. G. M. Williamson, 4½ S. Third St., Grand Forks.

OHIO: *Written.* Columbus, Dec. 13-15. Sec., Dr. H. M. Platter, 21 W. Broad St., Columbus.

OKLAHOMA: * Oklahoma City, Dec. 27-29. Sec., Dr. J. D. Osborn Jr., Frederick.

PENNSYLVANIA: Philadelphia and Pittsburgh, Jan. 4-6, Bedside, Jan. 6-8. Act. Sec., Bureau of Professional Licensing, Department of Public Instruction, Mrs. Marguerite G. Steiner, 358 Education Bldg., Harrisburg.

SOUTH CAROLINA: Charleston, Dec. 20-22. Sec., Dr. N. B. Heyward, 1329 Blanding St., Columbia.

SOUTH DAKOTA: * Pierre, Jan. 18-19. Dir., Medical Licensure, State Board of Health, Dr. Gilbert Cottam, Pierre.

UTAH: *Reciprocity.* Salt Lake City, Dec. 20. *Examination.* Salt Lake City, Dec. 28-30. Asst. Dir., Department of Registration, Miss Rena B. Loomis, 324 State Capitol Bldg., Salt Lake City.

VERMONT: Burlington, Dec. 16-18. Sec., Dr. F. J. Lawliss, Richford.

VIRGINIA: Richmond, Dec. 14-17. Sec., Dr. J. W. Preston, 30½ Franklin Road, Roanoke.

WASHINGTON: * Seattle, Jan. 10-12. Dir., Department of Licenses, Mr. Thomas A. Swayze, Olympia.

WEST VIRGINIA: Charleston, Jan. 3-5. Commissioner, Public Health Council, Dr. John E. Offner, State Capitol, Charleston.

WISCONSIN: * Madison, Dec. 13-15. Sec., Dr. C. A. Dawson, Tremont Bldg., River Falls.

WYOMING: Cheyenne, Feb. 7-8. Sec., Dr. M. C. Keith, Capitol Bldg., Cheyenne.

* Basic Science Certificate required.

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

ARIZONA: Tucson, Dec. 21. Sec., Dr. R. L. Nugent, Science Hall, University of Arizona, Tucson.

CONNECTICUT: Feb. 12. Address State Board of Healing Arts, 250 Church St., New Haven.

DISTRICT OF COLUMBIA: Washington, April 17-18. Sec., Commission on Licensure, Dr. G. C. Ruhland, 6150 E. Municipal Bldg., Washington.

IOWA: Des Moines, Jan. 11. Dir., Division of Licensure and Registration, Mr. H. W. Grefe, Capitol Bldg., Des Moines.

MICHIGAN: Ann Arbor and Detroit, Jan. 14-15. Sec., Miss Eloise LeBeau, 101 N. Walnut St., Lansing.

MINNESOTA: Minneapolis, Jan. 4-5. Sec., Dr. J. C. McKinley, 126 Millard Hall, University of Minnesota, Minneapolis.

NEBRASKA: Omaha, Jan. 11-12. Dir., Bureau of Examining Boards, Mr. Oscar F. Humble, 1009 State Capitol Bldg., Lincoln.

NEW MEXICO: Feb. 7. Sec., Miss Pia Joerger, State Capitol, Santa Fe.

OREGON: Portland, March 4. Sec., Board of Higher Education, Mr. C. D. Byrne, University of Oregon, Eugene.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Workmen's Compensation Acts: Compensability of Disability from Idiosyncrasy to Soap Required to Be Used in Course of Employment.—The workman instituted suit under the workmen's compensation act of New Mexico against his employer and the employer's insurer for an injury alleged to have been accidental and to have arisen out of and in the course of his employment as a printer. The trial court found that in the course of the workman's employment it was necessary that he cleanse his hands frequently with a "lava soap" furnished by the employer; that the employer furnished a soap known as "Lan-O-Kleen," which had a base of lanolin and corn meal; that the workman was highly allergic to Lan-O-Kleen soap and as a result of his continued use thereof in the course of his employment for six or seven months large painful eruptions broke out on the backs of his hands which developed to such an extent that on a stated date he became completely disabled. The court found that the use of Lan-O-Kleen would not have caused injury to the workman except for his allergy and that the resulting injuries constituted an unlooked for mishap which was neither expected nor designed and which was accidentally caused. Accordingly compensation was awarded the workman, and the employer and the insurer appealed to the Supreme Court of New Mexico.

The appellants contended, in effect, that the injury suffered by the workman was not a compensable "injury by accident" within the meaning of the New Mexico workman's compensation act. In *Stevenson* v. *Lee Moor Contracting Co.*, 45 N. M. 354, 115 P. (2d) 350, said the Supreme Court, with respect to the phrase "injury by accident" this court said:

> We are satisfied with the conclusions of these courts, and hold that "injury by accident" means nothing more than an accidental injury, or an accident, as the word is ordinarily used. It denotes "an unlooked for mishap, or an untoward event which is not expected or designed."

We had reference there to the definition in Lord MacNaughton's opinion in *Fenton* v. *Thorley* (1903) A. C. 443, by the House of Lords, in which he stated:

> I come, therefore, to the conclusion that the expression "accident" is used in the popular and ordinary sense of the word as denoting an unlooked for mishap or an untoward event which is not expected or designed.

"Accident" is defined by Webster as follows:

> A befalling; an event that takes place without one's foresight or expectation; an undesigned, sudden, and unexpected event; chance, contingency; often, an undesigned and unforeseen occurrence of an afflictive or unfortunate character; casualty; mishap.

Lord MacNaughton's definition is substantially the same as that of Webster. It is obvious that the finding of the trial court brings the injury of the workman within the definition of "accident" as approved in the Stevenson case.

The employer and his insurer denied that the disability suffered by the workman was accidental because, so they contended, the so-called injury was not related to any specific time or event, a necessary fact to be found, so they asserted, to support a judgment in his favor. The New Mexico statutes, answered the Supreme Court, not only do not define the word accident but do not undertake to limit its meaning to "sudden" injuries as do those of a number of the states, nor is its meaning limited by any time test. Our statute is substantially the same as that of North Carolina, regarding which the supreme court of that state said in *McNeely* v. *Carolina Asbestos Co.*, 206 N. C. 568, 174 S. E. 509:

> An examination of the Workmen's Compensation Act of North Carolina discloses many uses of the expression "injured employee" without the qualifying words "accident" or "by accident." So that, unless we attempt to whittle down or enlarge words or undertake to put big threads through the eyes of little needles, it would seem manifest that our act did not undertake to limit compensation to cases where the injury was

begun and completed within narrow limits of time, but that it used the expression "injury by accident" in its common-sense everyday conception as referring to an injury produced without the design or expectation of the workman.

Accidental injuries, continued the court, are usually sudden happenings; and the time, event and circumstances can be definitely determined, but there are exceptional cases in which injuries are unquestionably accidental, although the precise time of their beginning is uncertain, such as those caused by breathing dust or gases, frost bite, slow poisoning, a series of slight injuries culminating in a serious one, etc. In determining whether there has in fact been an accidental injury, time ordinarily may be considered and may be decisive against the claim. But if from the evidence, though the time is not definitely fixed, it can be consistently said that there has been an accidental injury according to the common usage of that phrase it is sufficient. After all it is a question of accident or no accident, and the precise second, minute, hour or day that it occurred is but evidence to be considered with the other facts and circumstances of the case in deciding whether the injury was in fact accidental. True, there must be a time when it can be said with certainty that a compensable accidental injury has been inflicted; but the cause, and the coming into existence of the evidence characterizing it as a compensable one, need not be simultaneous events. An injury may be gradual and progressive, and not immediately discoverable, yet certainly and definitely progress to discovery and then to compensable injury. Such was the injury to the workman in this case. The time did arrive when his injuries totally disabled him so he could not work, and at that time he became entitled to compensation for total disability. The findings of the trial court do not advise us as to when the eruptions began to appear on the workman's hands, but we are informed that after the use of the soap for six months he had become totally disabled to perform any labor. In the beginning it may be assumed that the effect was not discoverable, but that it had some physiologic cumulative effect may be reasonably inferred from the fact that a continuous use caused the injury complained of. The injury to the workman was by accident, although it was produced gradually and progressively through a period of months. The court concluded therefore that the time of the injury was established with sufficient definiteness to warrant compensation under the New Mexico statute.

The employer and his insurer next contended that the injury to the workman was not compensable because the workman was not subjected to any unusual or extraordinary condition or hazard not usual to his employment and to which other workmen on the job or the community generally were not subjected. In the Stevenson case, supra, said the court, we stated that there are three classes in which industrial injuries may be divided: (1) those injuries which result from some fortuitous happenings, such as the breaking of machinery, explosions, collisions, etc.; (2) those injuries in which there is no accident separate and distinct from the injury that caused it, such as strain which causes back injury, rupture, blood clots, hemorrhage; ordinarily the unintended result of an intentional act; (3) those injuries suffered by workmen to which they do not contribute by any specific act and which happen while they are in the performance of their usual and customary duties under usual, ordinary and expected conditions and circumstances; such as death caused by lightning, exposure to the elements and changing temperatures, sunstroke, breathing smoke, gas, fumes, dust, etc. The washing of the workman's hands was a necessary part of the labor for which he was employed. His injury, therefore, arose out of and was suffered in the course of his employment, and, if accidental, it was compensable. It comes under our second classification; an injury that was the unintended result of an intentional act; received while performing his labor under the usual and ordinary conditions of his employment.

The appellants questioned whether there could be an accidental injury while performing duties under the usual and ordinary conditions of the employment and contended that but few, if any, supporting authorities can be found for such a view. It is true, said the Supreme Court, that there are cases which rest on the broad holding that an injury is not compensable as an industrial accident if it occurs while the workman is performing his labor under the usual and ordinary conditions of his employment, notwithstanding he may have suffered an accidental injury within the meaning of that phrase as popularly and ordinarily used. But by far the larger percentage of accidents occur while workmen are performing their labor under the usual and ordinary conditions of their employment. The cases which hold that there must be an accident, sudden and catastrophic in its nature, apart from the injury, regarding which the time, place and event can be definitely ascertained, also hold that such condition is supplied if there is something in the nature of the work itself that increased the hazard beyond that faced by other people in the same locality or not common to fellow employees, but that if the work was done with no unusual occurrence constituting a mishap or fortuitous happening and the laborer was working under the usual and ordinary conditions of his employment, then there would be no compensable accident. But on the other hand those courts which take a more liberal attitude toward the workman, whose decisions this court has followed, hold that the fact that the workman was or was not performing his labor in the usual and ordinary way is immaterial, if in fact there was an accidental injury suffered by him that arose out of, and happened in, the course of his employment. An injury resulting from unusual working conditions is usually held to be accidental, but there is nothing in the New Mexico compensation statutes that makes such condition (though there may not be an accident distinct from the injury) a necessary element of an accidental injury. Injuries often occur to workmen who have some physical condition or latent illness because of which the ordinary labor of the employment produces injuries that were not expected or designed, which would not have injuriously affected a well person. This court agrees with the Supreme Court of Washington in *Guiles* v. *Department of Labor,* 13 Wash. (2d) 605, 126 P. (2d) 195 in holding that "an accident arises out of the employment when the required exertion producing the accident is too great for the man undertaking the work, whatever the degree of exertion or the condition of the workmen's health."

Admittedly, continued the court, the workman's injuries in this case arose out of and were sustained in the course of his employment. His duties required him to wash his hands to prevent soiling the products of his labor. Except for his idiosyncrasy, it is true, he would not have suffered an injury, but the same may be said of a workman who, but for a defective physical condition, would have withstood the strain of his ordinary labors, yet suffered a compensable injury because of an exertion too great for one in his condition of health. Such are workmen who have heart afflictions, tuberculosis, etc., whose deaths result from strains or labor too heavy for their strength. As stated by the court of appeals of the fourth circuit in *Baltimore & Ohio Railway Company* v. *Clark,* 59 F. (2d) 595, the statute

says nothing about unusual or extraordinary conditions [of employment] . . . that he [the workman] may have been rendered more readily susceptible to injury than they [other workmen] were by reason of his physical condition cannot affect the matter.

Lava soap was a poison to the workman, and his injury was compensable.

The judgment of the trial court in favor of the workman was accordingly affirmed.—*Webb v. New Mexico Pub. Co., 141 P. (2d) 333 (N. Mex., 1943).*

Society Proceedings

COMING MEETINGS

Annual Forum on Allergy, St. Louis, Jan. 22-23. Dr. Jonathan Forman, 394 East Town St., Columbus, Ohio.

Association for Research in Nervous and Mental Diseases, New York, Dec. 17-18. Dr. Thomas E. Bamford Jr., 115 East 82d St., New York 28, Secretary.

Society of Surgeons of New Jersey, Atlantic City, January 29. Dr. Walter B. Mount, 21 Plymouth St., Montclair, N. J., Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1933 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

Alabama State Medical Assn. Journal, Montgomery

13:93-128 (Sept.) 1943

Juvenile Delinquency in Its Relation to War Effort. C. P. Taft.—p. 93.
Treatment of Compound Fractures. H. Gray.—p. 98.
Venereal Disease Problem from Air Corps Standpoint. G. W. Larimore. —p. 100.
Anal Fistula. W. J. Rosser.—p. 102.
Environmental Sanitation and Postwar Planning. T. H. Milford.—p. 107.

13:129-156 (Oct.) 1943

*Recent Advances in Treatment of Ruptured (Lumbar) Intervertebral Disks. W. E. Dandy.—p. 129.
Aviation Medicine. B. Groesbeck Jr.—p. 132.
Suggested Treatment of Meningococcic, Pneumococcic and Influenzal Meningitis, with Special Reference to Sulfonamides. S. H. Welch and Vera B. Stewart.—p. 134.
Constrictive Pericarditis. C. Grote.—p. 141.

Ruptured Lumbar Intervertebral Disks.—According to Dandy spontaneous cures in cases of ruptured intervertebral disks are rare, although temporary remissions are the rule. There are two components of a ruptured disk: (1) the necrotic interior causing backache and (2) the protruding portion causing sciatica. The diagnosis of a ruptured disk is made solely from the signs, symptoms and x-ray examinations of the spine. Spinal injections of contrast mediums and spinal punctures are contraindicated; they are unnecessary and they will diagnose only one third of the total number. The small (concealed) disks outnumber the protruding ones two to one. They cannot be detected with spinal injections of contrast mediums. Two disks are involved in about 80 per cent of the cases, and occasionally there is a third ruptured disk. The exposure is unilateral and between the laminae without removal of bone (Love's operation) or, when the interlaminal opening is too small, the removal of a small bite of lamina may be necessary. Mobility of the vertebra, tested by pressure on the spinous process, will usually determine whether the disk is at the fourth or fifth lumbar (98 per cent are at these two disks) or at both. The entire necrotic content of the interior of the disk should be thoroughly removed with curets. This is the best insurance against recurrences. Fusion operations are unnecessary and are contraindicated. Fusion of the vertebrae occurs after removing the necrotic contents of the disk. The reason for the localization of 98 per cent of the lumbar disks to the fourth and fifth lumbar is probably due to a shift in the plane of the lateral articular processes from the horizontal to a transverse direction.

American Journal of Clinical Pathology, Baltimore

13:441-504 (Sept.) 1943

*Carcinoma of Stomach: Prognosis Based on Combination of Dukes' and Broders' Methods of Grading. G. R. Dochat and H. K. Gray.—p. 441.
Pathology of Lymph Nodes: Diagnosis and Prognosis. N. A. Murray and A. C. Broders.—p. 450.

Prognosis of Carcinoma of Stomach.—Dochat and Gray discuss two factors which influence the period of survival after operation for carcinoma of the stomach: the grade of malignancy of the lesion as determined by the method of Broders and the extent or spread of the lesion. They used the Dukes method of typing gastric carcinomas in combination with Broders' method of grading the malignancy in an effort to determine the period of survival of a particular patient. They limited their study to the cases of gastric carcinoma in which operation was performed at the Mayo Clinic in the years of 1922 and 1934 inclusive. Only those cases were considered in which gastric resection furnished sufficient tissue to permit microscopic examination. In all, they studied 1,251 cases. They designate as type A lesions in which carcinoma involves only the mucosa and is not seen microscopically below the muscularis mucosae. Type B_1 lesions are those in which carcinoma extends from the submucosa into the muscularis and involves all or part of the stomach musculature; type B_2 lesions are those which have spread through the entire wall and have involved the serosa. Type C lesions include those in which there is metastatic involvement of the regional lymph nodes. All carcinomas studied were also graded according to the manner of Broders. The prognosis was found to be excellent in cases in which the lesion is either grade 1 or 2 or type A, B_1 or B_2. In cases in which the lesion is grade 3 or 4, or particularly if it is type C, the chance for postoperative survival is poor. Each of these methods when employed separately is inadequate for estimating accurately the period of survival. Combination of the methods is exceedingly useful. By using either of the methods alone, the tempering effect of the method not used is lost. The ideal conditions for treatment obtained in only 20 out of 1,045 cases, that is, in less than 2 per cent. In these cases the lesion was diagnosed early and removed promptly. Only 25 per cent of patients who come to the clinic because of a malignant lesion of the stomach undergo a gastric resection. The hospital mortality rate will be 16 per cent, and only 30 per cent of the remaining patients will live five years or more. Only 6 patients out of every hundred who have a malignant lesion of the stomach will live five years after the diagnosis is made.

American Journal of Ophthalmology, Cincinnati

26:1011-1134 (Oct.) 1943

Story of Red Cross Institute for Blind (1918-1925) in Relation to Present Problem of War Blinded. A. C. Woods.—p. 1011.
*Corneal Vascularization Problems. D. Vail and K. W. Ascher.—p. 1025.
Intraocular Injection of Sulfanilamide in Case of Purulent Iridocyclitis. J. Igersheimer.—p. 1045.
Combined Ptosis Operation. O. H. Ellis.—p. 1048.
Procedures and Appliances That are Helpful in Treating Industrial Ocular Injuries. W. B. Clark.—p. 1044.
Improved Technic for Implantation of Ball in Tenon's Capsule. F. H. Verhoeff.—p. 1057.
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Ocular Findings in Case of Periarteritis Nodosa: Case Report. I. E. Gaynon and Mary Knight Asbury.—p. 1072.
Summary of Findings at Eye Examination of Preparatory School Boys. A. E. Sloane and J. R. Gallagher.—p. 1076.
Visual Phenomenon Related to Binocular Triplopia. H. M. Burian. —p. 1084.

Corneal Vascularization Problems.—Vail and Ascher compare their observations on the corneas of 711 patients seen in the Nutrition Clinic in Birmingham, Ala., during 1940 and 1941 and in the outpatient department of the ophthalmic department of the University of Cincinnati College of Medicine in 1942 with Sydenstricker's description of corneal vascularization caused by vitamin deficiency. They stress that concentric collaterals are engorged parts of the preexistent limbal meshwork. Any long standing engorgement in conjunctival vessels may induce formation of concentric collaterals. They probably are due to a hindrance of venous outflow from the immediately corresponding venous limb and are a kind of collateral circulation leading to the conjunctival veins in the horizontal meridian because of overcrowding in the original venous drainage. This cannot be achieved without dilatation of the particular loops that have to form the new detour. The dilatation of these vessels persists after disappearance of the provoking cause. In a similar way, after engorgement of lower degree or of shorter duration dilated single loops may be observed around the corneal limbus. They probably are forerunners of concentric collaterals and are as uncharacteristic of vitamin deficiency as are the developed concentric collaterals. The occurrence of engorged limbal loops and concentric collaterals in the Birmingham and in the Cincinnati patients was more frequent in the female sex and was distributed over all age groups. No relationship could be deduced between any particular type of vitamin deficiency and concentric collaterals. All Birmingham patients gave a history of repeated conjunctivitis or exhibited signs of it. Among 69 cases selected at random in the Cincinnati Eye Clinic there were 37 in which congestion was present in the limbal region, 31 of which showed typical concentric collaterals. The female sex predominated in the positive group. The percentage was higher in white than in Negro patients. The nasal limbus was involved more often than the temporal limbus, and the

upper limbus more often than the lower limbus. There was no relationship between the dietary habits and the frequency of vascular congestion in the limbal region. The number of positive cases was higher in the good diet group than in the poor diet group. Even the number of bilateral cases was higher in the group of well nourished patients.

American Journal of Physiology, Baltimore

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Responses of Heart to Reflex Activation of Right and Left Vagus Nerves by Pressor Compounds Neosynephrin and Pitressin. H. F. Haney, A. J. Lindgren, A. I. Karstens and W. B. Youmans.—p. 675.

Potassium and Cause of Death in Traumatic Shock. A. W. Winkler and H. E. Hoff.—p. 686.

Effects Produced by Vitamin D on Energy, Appetitie and Estrous Cycles of Rats Kept on Exclusive Diet of Yellow Corn. C. P. Richter and Katherine K. Rice.—p. 693.

Effect of Dietary Changes on Urine Volume and Renal Function in Experimental Diabetes Insipidus. C. A. Winter, W. R. Ingram and R. C. Eaton.—p. 700.

Observations on Polyuria Produced by Desoxycorticosterone Acetate. C. A. Winter and W. R. Ingram.—p. 710.

Effects of Potassium Arsenite (Fowler's Solution) on Respiration and Glycolysis of Normal and Leukemic Tissues, with Observations on Action of Menadione (2-Methyl-1, 4 Naphthoquinone). C. O. Warren. —p. 719.

Augmentation of Blood Flow in Coronary Arteries with Elevation of Right Ventricular Pressure. D. E. Gregg, W. H. Pritchard, R. E. Shipley and J. T. Wearn.—p. 726.

Anterior Cardiac Veins: Their Functional Importance in Venous Drainage of Right Heart. D. E. Gregg, R. E. Shipley and T. G. Bidder. —p. 732.

Presence in Normal Urine of Cortin-like Material Which is Active in Muscle Work Test. R. A. Shipley, R. I. Dorfman and B. N. Horwitt.—p. 742.

Comparison of Motor Integration in Mouse, Rat, Rabbit, Dog and Horse. R. Gesell and A. K. Atkinson.—p. 745.

American Review of Tuberculosis, New York

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Complications of Closed Intrapleural Pneumonolysis. J. Goorwitch.—p. 205.

*Empyema: Prophylaxis and Treatment. A. B. Dickey.—p. 222.

*Pneumonectomy in Pulmonary Tuberculosis. H. J. Lorge and P. Dufault.—p. 229.

Cephalosporium in Pleural Fluid. R. Douglass and S. E. Simpson.—p. 237.

Tuberculin Patch Test: Noncommercial. M. Grozin.—p. 241.

Scheme for Numerical Recording of Tuberculous Changes in Experimentally Infected Guinea Pigs. W. H. Feldman.—p. 248.

Promin in Experimental Tuberculosis: Comparative Results of Continuous and of Intermittent Treatment of Tuberculous Guinea Pigs with Sodium p,p'-Diaminodiphenylsulfone-N, N'-Didextrose Sulfonate (Promin). W. H. Feldman and H. C. Hinshaw.—p. 256.

Effects of Secondary Micro-Organisms on Experimental Tuberculosis in Rabbits: Part II. H. A. Poindexter.—p. 261.

Prophylaxis and Treatment of Empyema.—Where pneumothorax is given for intensive, widespread tuberculosis, the incidence of empyema will be high. Tuberculous empyema is much more prone to occur in pneumothorax cases in which the collapse is mechanically unsatisfactory and in patients with tuberculosis who do not adhere strictly to the rest cure. Overexercise will aggravate tuberculosis of the pleura. The percentage of tuberculous empyema complicating artificial pneumothorax is given by authorities as from 10 to 15. Tuberculous, empyema following closed intrapleural pneumonolysis is not more frequent than in pneumothorax without pneumonolysis. At the Arkansas Tuberculosis Sanatorium in 1941, closed intrapleural pneumonolysis was done on 139 patients. To date, only 5 of these (3.6 per cent) have developed tuberculous empyema. This operation is responsible for some cases of empyema, but it prevents far more cases than it causes. The incidence of empyema following open extrapleural pneumonolysis is considerable. In a series of twenty-four operations of this type, 9 patients (37.5 per cent) developed tuberculous empyema. The author has abandoned this type of operation except as a preparation for thoracoplasty. It should never be used for any other purpose. Tuberculous empyema responds at times to all accepted methods of treatment, but best results are obtained by obliteration of the pleural cavity, whether by aspiration and reexpansion of the lung or by extrapleural thoracoplasty. Mixed empyema must be treated by open surgical drainage. Unless the pleural cavity can be obliterated, the outcome is almost always fatal, even after the empyema is drained. Sulfonamide therapy is of little or no value in mixed empyema. Persistent pleural effusion, tuberculous empyema and mixed empyema are stages in the same pathologic process. Tuberculous empyema can be largely prevented by resorting to closed intrapleural pneumonolysis early. Where adhesions cannot be cut, pneumothorax should usually be abandoned.

Pneumonectomy in Pulmonary Tuberculosis.—Lorge and Dufault report 3 cases of total pneumonectomy performed at the Rutland State Sanatorium in Massachusetts. In the first case a complete occlusion of a main bronchus was bronchoscopically visible. In the second, stenosis existed. In the third, no bronchial disease could be seen through the bronchoscope, but there was clinical evidence of repeated blockage of secretions. The symptoms of bronchial stenosis consisted of wheezing, retention of sputum, bouts of uncontrollable cough, fever and malaise, followed by profuse expectoration. These bouts occurred frequently and lasted from a few days to several weeks. When the development of bronchial stenosis and the accompanying symptoms of blockage created an intolerable situation there was no alternative but to permit the disease to continue its unfavorable course or to attempt extirpation of the lung on the side of the diseased bronchus. The authors concur with Alexander in regarding bronchial stenosis sufficient to cause partial blockage of the secretions and complete bronchial occlusion as the chief indication for pneumonectomy in tuberculosis. Their first patient developed a lesion in the contralateral lung in three months and died six months after the operation. The second patient, in whom a three rib thoracoplasty preceded the pneumonectomy, had a new lesion in the contralateral lung six months after the resection of the lung. In the third a pneumonectomy performed ten years after thoracoplasty has given satisfactory results.

Annals of Otol., Rhin. and Laryngology, St. Louis

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Penicillin and Tyrothricin in Otolaryngology: Based on Bacteriologic and Clinical Study of 118 Patients. S. J. Crowe, A. M. Fisher, A. T. Ward Jr. and M. Kathleen Foley.—p. 541.

Simulation of Deafness. W. E. Grove.—p. 573.

*New Method for Treatment of Acute Aero Otitis Media. R. H. Wiseheart.—p. 581.

Interrelationship of Upper and Lower Respiratory Infections: Emphasizing Routes of Infection. J. G. McLaurin.—p. 589.

Observations on Paranasal Sinusitis Among Patients Subjected to Lobectomy for Bronchiectasis. K. M. Simonton.—p. 598.

Nonsurgical Aspects of Treatment of Acute Laryngotracheobronchitis. H. L. Baum.—p. 608.

Acute Thyroiditis in Relation to Deep Infections of Neck. D. Higbee. —p. 620.

Supplementary Report on Extralaryngeal Arytenoidectomy as Relief for Bilateral Abductor Muscular Paralysis of Larynx. J. D. Kelly. —p.628.

Some Aspects of Emergency Plastic Surgery in War Injuries of Face. J. M. Converse.—p. 637.

Roentgen Therapy of Laryngeal Tuberculosis. C. W. Engler.—p. 655.

Sound Transmission Through Ear and Its Relation to Sound Injury. F. M. Grossman.—p. 666.

New Treatment of Acute Aero Otitis Media.—According to Wiseheart, aero otitis media is a common ailment among flying personnel, especially during the season of acute upper respiratory infections. The condition can be effectively treated by the Proetz displacement method. The nasal mucosa is shrunk by application of a suitable vasoconstrictor solution, such as 2 per cent ephedrine sulfate in isotonic solution of sodium chloride. When shrinkage has been accomplished, the patient is instructed to clear the nose by gentle blowing. He is placed on his back in such a way that the head is inverted so that the chin and the external auditory meatuses are in the same vertical plane. While the patient is quietly breathing with his mouth widely open, 3 cc. of a weak vasoconstrictor, e. g. 0.5 per cent ephedrine sulfate in isotonic solution of sodium chloride, is slowly introduced into the upper portion of each nostril, covering the eustachian orifices in the nasopharynx. Negative pressure (approximately 180 mm. of mercury) is then applied intermittently to one nostril by means of the displacement syringe, while the operator's finger closes the other and the patient closes the pharynx by saying "kay" or "cake." This procedure is repeated for six fluctuations to each nostril and the patient is allowed to sit erect. After ten minutes to allow the vasoconstrictor sufficient time to shrink the nasopharyn-

geal tissues, the same instillation-suction procedure is repeated. Usually during this maneuver the patient feels the vacuum release and he will be able to open the ear at will. In the beginning of this treatment fliers with aero otitis media were kept grounded for not less than six days in spite of their apparent improvement or cure. Later, Navigation Cadets were grounded for only twenty-four hours, provided the ear drum had returned to normal and the Weber test indicated the removal of the obstructive deafness. More recently, pilots have been allowed to return to flying even as soon as six hours after treatment.

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Gastric Histology and Subtotal Gastrectomy. A. J. Gitlitz and R. Colp. —p. 523.
*Effect on Gastric Acidity of Gastroenterostomy and Gastric Resection for Peptic Ulcer. G. J. Heuer and C. Holman.—p. 551.
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Pilonidal Cysts and Sinuses. F. C. Shute Jr., T. E. Smith, M. Levine and J. C. Burch.—p. 706.
*Thrombosis and Embolism: Review of 202 Patients Treated by Femoral Vein Interruption. A. W. Allen, R. R. Linton and G. A. Donaldson. —p. 728.

Effects of Grafts of Jejunum in Stomach on Secretion and Ulcers.—Andrus, Lord and Stefko demonstrated in dogs that a pedicle graft of jejunum implanted in the stomach wall produces profound effects on the gastric secretion. These effects consist in a reduction of the fasting free acidity and a diminution, or actual reversal, of the normal response of the gastric acidity to such secretory stimulants as histamine and alcohol. Such effects are not produced by the ordinary gastrojejunostomy but appear promptly when the bowel about the stoma is converted to a pedicle graft and the normal continuity of the tract is reestablished. Grafts from the colon or ileum are without such action, while those taken from the duodenum are effective but considerably less so than jejunal implants. The presence of the factor responsible can be demonstrated in saline washings of isolated jejunal loops, and accumulated evidence indicates that its effects are exerted by actual inhibition of acid secretion, at least so far as the response to histamine is concerned, rather than by neutralization. Pedicle jejunal grafts were effective both in the prevention and in the cure of experimental ulcers produced in dogs by the prolonged administration of histamine phosphate. The effects of a pedicle jejunal graft are lost in the presence of a gastroenterostomy or pyloroplasty. The operation has been applied to patients with duodenal or marginal ulcer with excellent immediate clinical results in all and with gastric secretory changes in 2 of the 3 studied for a sufficient period after operation. If subsequent work confirms these findings, this may constitute a new approach to the surgical treatment of peptic ulcer.

Effect of Gastric Surgery on Acidity.—In the course of a study of 1,200 patients with peptic ulcer admitted to their wards in the past ten years, Heuer and Holman have assembled those patients who have been subjected to operation and who have had careful preoperative and postoperative acidity determinations made. The purpose of the study has been (*a*) to determine the effect of gastroenterostomy and gastric resection on acid secretion, (*b*) to determine the acid secretion according to the magnitude of gastric resection, (*c*) to determine the results of operation in relation to the postoperative acid secretion and (*d*) to determine the results of operation regardless of the acid secretion. A study of the preoperative and postoperative acidities of 163 patients with peptic ulcer subjected to gastroenterostomy or gastric resection shows that postoperatively 61, or 37.4 per cent, have achlorhydria or low acidity, while 102, or 62.6 per cent, have an adequate or high acidity. In the presence of these acidity findings 136, or 83.4 per cent, of the patients have satisfactory clinical results. This lack of correlation between acidity and results leads the authors to doubt that a reduction in acid secretion is the sole factor in these two types of operation. Following gastroenterostomy there is no significant change in acid secretion, yet in this series of 75 patients 75 per cent have satisfactory results. It must be presumed that dilution and neutralization of acid rather than reduction in acid is the effective means of achieving these results, if acid is the important factor in the genesis of ulcer. Following gastric resection there is in general a reduction in acid secretion in proportion to the extent of the resection. But resection of any magnitude, consistent with a reasonable mortality, does not ensure achlorhydria. Moreover, when comparing the clinical results with the acidity a lack of correlation is again found; for in minimal resection 90 per cent of the patients have satisfactory results, while 25 per cent have a reduction in acid. It appears of doubtful value to pursue the idea of ensuring achlorhydria and, therefore, better results by larger and larger resections. The observations presented do not controvert the etiologic relationship between acid and ulcer.

Thyrocardiac Disease.—Lahey and his associates feel that the advances in the surgical treatment of the thyrocardiac patient in the last twenty-five years have been gratifying. These advances fall into five periods. In the first period, approximately twenty-five years ago, most cases with a diagnosis of thyroid disease and associated cardiac failure were rejected as hopelessly inoperable, because the mortality was almost prohibitive. The second period started a little over twenty years ago, when Hamilton described the diagnostic difficulties and surgical treatment of these patients and applied to them the term thyrocardiac. In this era it was demonstrated that these patients could endure subtotal thyroidectomy with a reasonable mortality and that subsequently an extraordinary degree of activity and cardiac capacity were restored and retained. The third period, in which iodine was popularized by Plummer, was a most important one, since it contributed materially to reduction of operative mortality. In the fourth period total ablation was advocated by Blumgart, Levine and Berlin. This method has been largely discarded. The fifth, and present, period is characterized by a much better understanding of what causes decompensation in a patient with hyperthyroidism, why the patient is so dramatically benefited by subtotal thyroidectomy and why the benefits of subtotal and total thyroidectomy in a patient with decompensation but without hyperthyroidism are so transitory. This period is characterized by an improved understanding of oxygen needs, preoperative preparation, anesthesia selection, postoperative care and, less importantly, vitamins. Under the term thyrocardiac the authors place only those patients whose heart complications are definitely attributable to an overactive thyroid. They hope for a sixth period in which earlier diagnosis and operation, and even prophylactic subtotal thyroidectomy for early toxic adenoma and early auricular fibrillation, would give even better results.

Thrombosis and Embolism.—Allen and his associates stress the high percentage of emboli that can be traced to the leg veins. These thromboses usually start in the veins of the calf muscles and propagate into the larger veins of the leg. The long, straight femoral vein can harbor enough thrombus to occlude the pulmonary artery completely if it becomes free at one time. Actually, repeated minor infarcts, or at least sublethal emboli, may precede for several days and rarely for several weeks a fatal episode. Thyroid, heparin, leeches, lum-

bar sympathetic block and dicumarol were variously employed. Homans suggested the feasibility of interrupting the deep veins of the leg to prevent pulmonary infarction. The authors ligated the femoral vein or veins in 202 cases. The indications are usually apparent. Pulmonary infarcts, tenderness over the leg veins, swelling of the leg, however slight, dilated superficial veins, discomfort in the calf muscles if the foot is passively dorsiflexed (Homans' sign), and slight elevation of temperature, pulse and respiration are all satisfactory guides. One usually has to make a decision on one or two of these criteria, although frequently all are present. Phlebograms are difficult to interpret and may be misleading. In a large majority of cases bilateral interruption should be undertaken. Unilateral interruption may be safely done in the younger age group. In patients beyond the age of 40 bilateral interruption at one sitting should be the rule. Mechanical removal of the thrombus from the vein by aspiration is a safe procedure. It certainly reduces the pain and swelling in the leg and hastens recovery. No deaths have occurred in a group of 202 patients as a result of femoral vein interruption. Sequelae are not severe and they are not disabling.

Archives of Dermatology and Syphilology, Chicago

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Mycosis Fungoides with Bullous Lesions: Report of Case Resistant to Roentgen and Arsenical Therapy: Effects of Empire Therapy, Partly Based on Laboratory Investigations. J. Garb and F. Wise.—p. 359.
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*Sudden Death of Young Athlete with Excessive Concentration of Epinephrine-like Substances in Heart Muscle. W. Raab.—p. 388.
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Alkaline Phosphatase Level in Urine in Relation to Renal Injury. C. Breedis, C. M. Flory and J. Furth.—p. 402.
*Fulminating Meningococcic Infection (Waterhouse-Friderichsen Syndrome). P. A. Herbut and W. E. Manges.—p. 413.

Thymus and Myasthenia Gravis.—Homburger reports that among 6,000 autopsies performed at the New Haven Hospital there were found 41 instances of tumor or of enlargement of the thymus. Twenty-seven of these were in children under 16 years of age. The remaining 14 include 3 cases of cancer, 3 of enlargement of the gland in thyrotoxicosis, 6 of enlargement of the gland encountered incidentally at necropsy and 2 of noncancerous thymic tumor coincident with myasthenia gravis. Epithelial metaplasia was a prominent feature and was accompanied by scarcity of the corpuscles of Hassall in the 2 thymic tumors associated with myasthenia gravis. This is in accordance with the conclusions of Bell, Lievre and Norris that thymic tumors in patients with myasthenia gravis are of a distinct type characterized by epithelial metaplasia; it is in contradiction to the more recent opinion of Obiditsch and Sloan, who stress the predominance of lymphoid tissue in thymic tumors of patients with myasthenia gravis.

Sudden Death of Athlete.—Raab reports necropsy findings in a young, seemingly healthy athlete, aged 21, who died suddenly. The only striking pathologic change observed was an excessively high concentration of epinephrine-like substances in the heart muscle (the highest of all values observed in a series of 54 normal and pathologic human hearts). From the results of studies of the hearts of animals and man it is concluded that this excessive concentration of sympathomimetic amines was incompatible with survival and was the immediate cause of death. The author suggests that chemical examination of the heart muscle may prove to be of forensic usefulness in cases of unexplained sudden death, particularly in those of death occurring under emotional or physical strain.

Fulminating Meningococcic Infection: Waterhouse-Friderichsen Syndrome.—Herbut and Manges review the history of the Waterhouse-Friderichsen syndrome and report 4 cases, bringing the total to 125. Because of the rapid onset and the high fever, often associated with leukocytosis and a fulminating course with fatal termination, the syndrome has long been regarded as an overwhelming septicemia. Although meningococci have been shown to be the causative agent in over 60 per cent, the authors believe that this figure is much too low. It is the consensus that adrenal apoplexy is responsible for the death of the patients. The authors, however, concur with Aegerter that there is no proof that death in the Waterhouse-Friderichsen syndrome is due to adrenal failure rather than to toxicity caused by invasion of the blood stream. In 3 of their cases there were bilateral and massive adrenal hemorrhages. In the fourth case only a single small circumscribed hemorrhage was found in the right adrenal gland, while both medullas showed areas of hypoplasia. Sections of skin in 3 cases showed respectively congestion of the dermal capillaries; congestion, hemorrhages and inflammation; and congestion, hemorrhages, inflammation and thrombosis. In 3 cases with predominantly septicemic symptoms there were found dissociation of the liver cords, cloudy swelling of liver cells, sinusoidal congestion, perisinusoidal edema and diffuse infiltration with polymorphonuclear leukocytes. Meningococci were isolated post mortem in pure culture from the spinal fluid and the cardiac blood in 1 case and ante mortem from the spinal fluid and the nasopharynx in 1 case. Postmortem blood cultures in the remaining 2 cases yielded respectively a member of the Friedländer group and Staphylococcus aureus. Sections of the skin in each of these and of the adrenal gland in the former disclosed within the capillaries gram negative, bean shaped diplococci morphologically similar to meningococci. It is probable therefore that most, if not all, of the cases of the Waterhouse-Friderichsen syndrome in which other organisms have been isolated were caused by meningococci.

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*Pregnancy Complicating Diabetes: Report of Clinical Results. Priscella White and Hazel Hunt.—p. 500.
Estrone Sulfate: Clinical Study. P. H. Fried and Q. Hair.—p. 512.
Present Status of Gonadotropic Therapy in Gynecologic Practice. M. E. Davis and A. A. Hellbaum.—p. 517.

Pregnancy Complicating Diabetes.—According to White and Hunt, pregnancy in diabetic women is often characterized by fetal wastage. The percentage of viable infants from diabetic mothers is still about the same as it was before the introduction of insulin. The authors made assays for chorionic gonadotropin and pregnandiol after the twenty-fourth week of pregnancy in 125 consecutive cases. Forty-one showed normal hormone excretion levels and 77 abnormal levels. In 27 of the latter replacement therapy was not employed. Of the 41 women classified as normal, none delivered prematurely, 2 per cent developed toxemia and 95 per cent of the fetuses survived. The 27 classified as abnormal and untreated developed toxemia in 52 per cent, premature delivery in 40 per cent and 60 per cent of the fetuses survived. Substitutional therapy was administered to 50 women with abnormal hormone excretion and 7 others classified as having had abnormal pregnancies because of past history or clinical signs. Toxemia appeared to be modified in this series. Premature delivery occurred in 25 per cent, and fetal survival was 92 per cent. The management of the pregnant diabetic women at the authors' clinic includes endocrine therapy if indicated, adequate control of carbohydrate metabolism and premature delivery. Fetal wastage in diabetic mothers seems to be related to an imbalance of chorionic gonadotropin and pregnandiol in pregnancy. Correction of the imbalance in this series appeared to be followed by fetal survival approaching that of the group classified as normal on the basis of hormone assays and also approaching the fetal survival of nondiabetic pregnancies.

Journal of Experimental Medicine, New York

78:225-326 (Oct.) 1943

Disappearance of Phosphatase from Hydronephrotic Kidney. H. A. Wilmer.—p. 225.
Stability of Variola Virus Propagated in Embryonated Eggs. J. B. Nelson.—p. 231.
*Laboratory Transmission of St. Louis Encephalitis Virus by Three Genera of Mosquitoes. W. McD. Hammon and W. C. Reeves.—p. 241.
Oxidation of p-Aminobenzoic Acid and Anthranilic Acid by Specifically Adapted Enzymes of Soil Bacillus. G. S. Mirick.—p. 255.
Susceptibility of Cebus Capucina (South American Ringtail Monkey) and Cercopithecus Cephus (African Mustache Monkey) to Poliomyelitis Virus. J. L. Melnick and J. R. Paul.—p. 273.
Effects of Roentgen Rays on Cell-Virus Associations: Findings with Virus Induced Rabbit Papillomas and Fibromas. W. F. Friedewald and R. S. Anderson.—p. 285.
Studies on Herpetic Infection in Mice. G. P. Berry and H. B. Slavin. —p. 305.

Laboratory Transmission of St. Louis Encephalitis Virus by Mosquitoes.—In previous communications Hammon and Reeves outlined the epidemiologic evidence pointing to mosquito transmission of St. Louis encephalitis virus. They now report mosquito transmission experiments which were performed in field laboratories in the lower Rio Grande Valley, Texas, and in the Yakima Valley, Washington. The St. Louis virus has been successfully transmitted in the laboratory by the following nine species of mosquitoes from three genera: Culex tarsalis, Culex pipiens, Culex coronator, Aedes lateralis, Aedes taeniorhynchus, Aedes vexans, Aedes nigromaculis, Theobaldia incidens and Theobaldia inornata. In experiments with Culex tarsalis, infection occurred from feeding on chickens and ducks which had been previously inoculated by the subcutaneous route. After an incubation period these mosquitoes infected other chickens and virus was in turn demonstrated in the blood of these. This is interpreted as proof that fowl may serve as reservoirs of virus in nature. Since mosquitoes have been repeatedly found naturally infected with St. Louis virus and epidemiologic evidence supports their incrimination, their role as vectors is now established.

Journal of Urology, Baltimore

50:265-388 (Sept.) 1943. **Partial Index**

Wilms's Tumor: With Report of 8 Year Cure. N. F. Ockerblad and H. E. Carlson.—p. 265.
Reimplantation of Renal Pelvis. S. F. Wilhelm.—p. 274.
Reproduction of Renal Overdistention Pain. Its Clinical Diagnostic Value. C. A. Wattenberg and D. K. Rose.—p. 280.
Estimation of Renal Function Based on Specific Gravity Changes Following Intravenous Urography. G. O. Baumrucker.—p. 290.
Experiences with Ureteral Calculi. H. S. Browne.—p. 301.
Fracture of Pelvis with Perforation of Urinary Bladder. A. E. Guerra. —p. 307.
*Response of Bladder Tumors to External Radiation. C. C. Herger and H. R. Sauer.—p. 310.
Gynecologic and Urologic Management of Cystocele. S. B. Potter and H. T. Low.—p. 322.
Hypospadias. H. L. Wehrbein.—p. 335.
Carcinoma of Prostate. O. J. Wilhelmi.—p. 341.
Operative Management of Hypertrophy of Prostate with Complicating Coronary Heart Disease. D. Antonio Jr.—p. 344.
Downward Suction Drainage After Prostatectomy. F. C. Hendrickson and H. K. Guth.—p. 355.
Genitourinary Tuberculosis in Army General Hospital. R. L. Smith and J. F. Harrold.—p. 361.
Urologic Factors Influencing Hypertension. B. A. Hayes and J. D. Ashley.—p. 366.
Premature Ejaculation: Review of 1,130 Cases. B. Schapiro.—p. 374.
Caruncle of Urethra in Female with Special Reference to Importance of Histologic Examination in Differential Diagnosis. H. W. E. Walther.—p. 380.

Response of Bladder Tumors to External Radiation.—Herger and Sauer report results in 160 patients with carcinoma of the bladder treated by external radiation. Twenty-five of these patients had papillary carcinoma, 91 had papillary infiltrating carcinoma and the remaining 44 had solid infiltrating carcinoma. If 200 kilovolts radiation was given, two, three and four fields were treated with a daily increment varying from 100 to 400 roentgens. If supervoltage radiation was employed, radiation was given through three or four ports with a daily increment of from 100 to 300 roentgens. Satisfactory results were obtained in more than 50 per cent of the patients with papillary and papillary infiltrating carcinomas. In 13 of these the tumor disappeared entirely after external irradiation

alone. In 44 definite regression in size and number of the tumor growth was obtained, rendering the tumor suitable for subsequent transurethral treatment. In 24 patients regression was only temporary. No response from external radiation was obtained in 35 patients with papillary carcinoma. Only 1 of the 44 patients with solid infiltrating cancer responded favorably; in the remaining 43 the response to irradiation was unsatisfactory. These tumors are radioresistant and are better treated with interstitial radiation or surgical procedures.

Medical Annals of District of Columbia, Washington

12:327-372 (Sept.) 1943

Presidential Address: ". . . Present Needs and Future Requirements." J. E. Paullin.—p. 327.
Surgical Treatment of Thrombosis of Peripheral Veins. J. R. Veal and H. H. Hussey.—p. 333.
Dementia Precox Complexes. J. R. Ernst.—p. 343.
Peritoneoscopy. L. Gerber.—p. 348.

Medicine, Baltimore

22:205-286 (Sept.) 1943

Physiologic Effects of Carbon Dioxide on Activity of Central Nervous System in Man, with Special Reference to Problem of High Altitude Flying: Review. Mary A. B. Brazier.—p. 205.
Tonus and Venopressor Mechanism: Clinical Physiology of Major Mode of Death. Y. Henderson.—p. 223.
Serum Sickness and Analogous Reactions from Certain Drugs, Particularly Sulfonamides. W. T. Longcope.—p. 251.

Military Surgeon, Washington, D. C.

93:339-388 (Oct.) 1943

Medical Department of U. S. Navy in Philippines. C. B. Camerer.—p. 339.
What Hitler Means in "Mein Kampf" or What American Soldier Should Know About Hitler's Book "Mein Kampf" in Case He Reads It. M. Moore.—p. 352.
Primary Atypical Pneumonia (Virus Pneumonia). F. D. Suttenfield.—p. 360.
Pneumonia: Survey of 106 Cases.—p. 364.
Technic for Apicocetomy with Immediate Root Filling. S. S. Shapiro and E. B. Master.—p. 368.
Adaptor for Fluoroscopic Depth Localization. L. Mackta.—p. 372.
Gas Mask Spectacle Pliers. K. D. MacMillan.—p. 375.

New England Journal of Medicine, Boston

229:533-570 (Sept. 30) 1943

Modern Pharmacy and the Medical Profession. H. C. Newton.—p. 533.
Study on Effectiveness of Dietary Consultation. H. T. Kelly and Myrtle Sheppard.—p. 536.
Potassium Sulfocyanate Therapy in Essential Hypertension. Ethel Fanson, Dera Kinsey and R. S. Palmer.—p. 540.
Physiology. H. E. Hoff.—p. 543.

229:571-604 (Oct. 7) 1943

Work of Massachusetts Boards of Registration in Medicine and Nursing. H. Q. Gallupe.—p. 571.
Carcinoma of Larynx. L. A. Schall.—p. 574.
Erythroblastosis Fetalis: Report of Case. G. J. Newerla.—p. 576.
Histamine by Mouth in Treatment of Vasomotor Rhinitis. J. C. Gant, R. J. Savignac and A. Hochwald.—p. 579.
Diagnosis of Gout. W. Bauer.—p. 583.

New Orleans Medical and Surgical Journal

96:129-176 (Oct.) 1943

Lesions of Stomach. F. J. Hodges.—p. 129.
Infantile Paralysis: Its Description and Treatment. Elizabeth Kenny.—p. 134.
*Chronicity of Leprosy. G. H. Faget.—p. 138.
American Contributions to Neurosurgery. C. Wilson.—p. 140.
Undulant Fever: Its Epidemiology and Diagnosis. P. K. Thomas.—p. 147.

Chronicity of Leprosy.—Faget found among 380 inmates at the National Leprosarium in Carville, La., 5 with the neural type of leprosy who have had the disease for 53, 51, 48, 46 and 41 years respectively. Eighteen others, 14 with neural and 4 with mixed leprosy, have survived 30 to 40 years of leprosy, and 32 (19 neural and 13 mixed cases) have suffered from leprosy for 20 to 30 years. Thus a total of 55 patients, over 14 per cent of the entire population of the National Leprosarium, show a chronicity of leprosy of over 20 years' duration. This chronicity is found chiefly in the neural type, for, although neural leprosy exists in less than 30 per cent of the total number of patients at the Carville leprosarium, 38 of the 55 patients (nearly 70 per cent) who had survived leprosy for more than 20 years had the neural type.

Ohio State Medical Journal, Columbus

39:889-984 (Oct.) 1943

Acquired Sensitivity to Injectable Liver Extracts. R. T. Warburton.—p. 905.
Epileptoid and Shock Phases of the Syncope Syndrome and Possible Role of Acetylcholine in Their Genesis. R. D. Barnard.—p. 907.
Psychologic Factors in Bilateral Prefrontal Lobotomy. G. W. Kisker.—p. 913.
Ligation of Inferior Vena Cava: Case Report. L. N. Atlas.—p. 917.
Two Cases of Brenner Tumor, One of Unusual Size. P. J. Reel and P. C. Foster.—p. 919.
Congenital Retroversion of Uterus. Misnomer. J. L. Bubis.—p. 922.
*Intravaginal Sulfanilamide Insufflation in Treatment of Trichomonas Vaginalis Vaginitis. R. K. Finley and J. M. Shaffer.—p. 924.
Management of Pregnancy and Labor Complicated by Extensive Bronchiectasis. Z. J. R. Hollenbeck.—p. 926.
Preventive Approach to Defective Hearing. E. E. Kleinschmidt.—p. 929.
Chronic Pyelonephritis with Hypertension and Vascular Disease of Alimentary Tract.—V. D. Hauenstein and Pearl M. Zeek.—p. 932.

Intravaginal Sulfanilamide Insufflation in Trichomonas Vaginalis Vaginitis.—Finley and Shaffer employed intravaginal insufflation of sulfanilamide powder in the treatment of 31 patients with Trichomonas vaginalis vaginitis. Following one insufflation of 3 Gm. of powder, all symptoms subsided within a matter of hours. The powder appears to act specifically against both the flagellates and other bacterial invaders commonly found in conjunction with them.

Psychosomatic Medicine, Baltimore

5:323-404 (Oct.) 1943

The Unfit: How to Exclude Them. L. G. Rowntree.—p. 324.
Multiple Choice Test for Screening Purposes (for Use with Rorschach Cards or Slides). M. R. Harrower-Erickson.—p. 331.
The Unfit: How to Use Them. H. W. Brosin.—p. 342.
Sociopsychiatric Investigation of Schizophrenia Occurring in Armed Forces. W. Malamud and Irene Malamud.—p. 364.
On So-Called War Neuroses. K. Goldstein.—p. 376.

Virginia Medical Monthly, Richmond

70:485-542 (Oct.) 1943

Treatment of Pneumonia and Its Complications. J. H. Smith.—p. 488.
*Meningococcic Meningitis: Clinical Evaluation of 27 Cases Observed at Riverside Hospital, Newport News, Va., from Nov. 1, 1942 to May 3, 1943. E. B. Mewborne, I. S. Tolpin and G. Hirschberg.—p. 492.
Recent Advances in Intracapsular Cataract Surgery. E. G. Gill and J. H. Gressette.—p. 501.
Meningococcic Meningitis Treated with Sulfadiazine. J. S. Weitzel.—p. 505.
Robert Honyman, Doctor of Physic. M. H. Harris.—p. 507.
Cerebral and Basal Ganglia Degeneration Due to Anoxia Secondary to Anesthesia: Case Report. W. D. Suggs.—p. 513.

Meningococcic Meningitis.—Mewborne and his associates report 27 cases of epidemic meningitis treated at the Riverside Hospital of Newport News, Va., during a six month period. During increased prevalence of epidemic meningitis spinal puncture should become a routine measure. In all questionable cases repeated punctures should be done at twenty-four hour intervals. It is essential to watch for atypical cases, such as the severe septicemic form. Absence of signs of meningeal irritation does not exclude meningitis. The authors cite 3 cases in which stiff neck and Kernig's sign were absent. Three cases are reported because of the rapidity of onset; there was little or no prodromal period. In 1 case a meningococcic pneumonia developed, which did not respond to treatment. Age plays a decisive part in prognosis; in children and young persons it is favorable. The average case of epidemic meningitis will respond to adequate sulfadiazine therapy in from twenty-four to forty-eight hours. Treatment should be aimed at the early procurement of a high sulfadiazine blood level by a high initial dose followed by an adequate maintenance dose. Kidney complications due to sulfadiazine toxicity can be averted or mitigated by (*a*) alkalization and forcing fluids, (*b*) daily urine analysis and charting of intake and output and (*c*) discontinuance of sulfadiazine when signs of renal lesions develop.

Western J. Surg., Obst. & Gynecology, Portland, Ore.

51:389-418 (Oct.) 1943

Subcutaneous Symphysiotomy in Incomplete and Complete Deflexion of Head.—p. 389.
Pyelonephritis. G. Prewitt.—p. 393.
Ergonovine by Vein During Second Stage: Observations in Private Practice. G. McConnell and G. C. Schauffler.—p. 403.
Practical Aspects of Endocrine Therapy. S. C. Freed.—p. 407.
Premarital Examination. Nadina Davinoky.—p. 412.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Surgery, Bristol

31:1-100 (July) 1943

Role of Bile in Duodenal Regurgitation. L. R. Braithwaite.—p. 3.
*Role of Chemotherapy in Treatment of Hematogenous Osteomyelitis. K. C. McKeown.—p. 13.
Intussusception of Appendix. K. Fraser.—p. 23.
Calculi Impacted in Lower Fourth of Ureter: Their Removal by Ureteral Corkscrew. J. C. Ainsworth-Davis.—p. 34.
History of Blood Transfusion, 1628-1914. G. Keynes.—p. 38.
*Abdominal Injuries Due to Under-Water Explosion. G. R. Cameron, R. H. D. Short and C. P. G. Wakeley.—p. 51.
*Clinical Study of Injuries of Abdomen Due to Under-Water Explosion. W. G. Gill and C. P. Hay.—p. 67.

Chemotherapy in Hematogenous Osteomyelitis.—According to McKeown chemotherapy may limit the extent of surgical intervention in acute osteomyelitis. He treated 26 cases with sulfathiazole in combination with various types of surgical intervention. In group 1 sulfathiazole was given in doses of 1 Gm. to 20 pounds (9 Kg.) of body weight daily. Administration was begun at the onset of the disease and continued for eight days. A repeat course of similar dosage and duration was given after an interval of three weeks. The surgical treatment in these cases consisted in making multiple drill holes in the metaphysis. Operation was carried out between the second and the sixth day of the disease, and the closed plaster technic was adopted. Patients in group 2 were given sulfathiazole in adequate doses. In the first case in this group no operation in the acute stage of the disease was carried out, while in the other cases only the periosteum was incised. In group 3 sulfathiazole was given in two courses as in the first group, but the operative treatment consisted in incision of the periosteum and extensive bone guttering. Group 4 consisted of cases in which bone drilling was carried out, but sulfathiazole was either given in small doses or its administration was not started until a considerable time after the onset of the disease. The administration of sulfathiazole in the early stages of acute osteomyelitis, when combined with bone drilling, appears to confine the destructive bone changes to a relatively small area and to minimize their severity. The duration of the disease also is remarkably short. When sulfathiazole is given at a late stage in the disease or in small doses, as in group 4, the favorable features observed in group 1 are no longer attained, though the surgical intervention was identical. Early administration of adequate doses of sulfathiazole is not in itself sufficient to limit the severity of bone infection unless combined with surgical intervention. Simple incision of the periosteum does not provide sufficient drainage, while the procedure of bone guttering appears to be unnecessarily extensive and even harmful.

Abdominal Injuries Due to Under-Water Explosion.—Cameron and his associates report 20 cases in which operation was done for abdominal injuries due to under-water explosions from depth charges, mines, bombs and torpedoes. There were ten deaths, or a mortality of 50 per cent. The commonest lesions were retroperitoneal and subserous hemorrhages, which occurred in all cases. Perforations of the cecum were present in 9 cases and of the ileum in 7 cases, while multiple perforations were present in 4 cases. Late perforations occurred in 2, the cause being probably hemorrhages initiated by the primary injury. These local hemorrhages in the wall of the bowel gradually became infected and ruptured into the peritoneal cavity. The intestinal lesions varied from intramural hemorrhages to laceration of the intestinal wall. The large intestine suffered more than the stomach or small bowel (14 cases out of the total of 20) because the effects of blast are always more severe on air filled cavities and because the large intestine is not as muscular as the stomach or the small bowel. In 80 cases in which recovery occurred from the immersion blast without operation the commonest symptom was abdominal pain which persisted for from three days to three months. Melena was present in 82 per cent of these and in some it persisted for four months. In 20 per cent there was a history of hemoptysis, and in 14 per cent hematemesis was reported. There was no history of external injury. Of 32 cases in which sigmoidoscopy was performed only 2 presented definite abnormality, and in these cases small scattered petechial hemorrhages could be seen high up on the rectal wall and in the lower sigmoid. Examination a month later revealed a normal mucous membrane. Patients who recover from immersion blast rarely suffer from permanent effects. The authors also report experimental studies on 16 goats.

Abdominal Injuries Due to Under-Water Explosion.—Gill and Hay report clinical observations on 16 patients following injury to the abdomen by under-water explosion. These men had been in the vicinity of exploding depth charges, and 3 were involved by the explosion of a destroyer's magazine. There were no direct gunshot wounds of the abdomen. The clinical picture varied considerably, from those who climbed aboard the hospital ship unassisted and complained only of abdominal pain associated with tenderness and rigidity of the abdominal wall, to those who were profoundly shocked and obviously suffering from a severe intra-abdominal catastrophe. The presenting symptoms always was abdominal pain, varying from a dull ache to a pain of agonizing character, and this was associated with a corresponding variation in the physical signs. Six patients were operated on. Of these 2 recovered, 1 having had two ileac perforations sutured and the other a diffuse peritonitis without discernible perforation and a postoperative pelvic abscess which developed later. Four died, 3 having sustained perforations of one or more hollow viscera, and 1 with subserous ecchymoses of the mesentery and small intestine and a severe lung injury. It is almost impossible to say during the first few hours after the injury which patients will require surgical treatment. After the preliminary treatment for shock and response to this treatment the presence of severe, unremitting and more especially increasing abdominal pain, with tenderness and rigidity of the lower abdomen, particularly in the presence of melena, bowel actions and difficulty in micturition, are indications for laparotomy. A midline abdominal incision is recommended.

Journal of Endocrinology, London

3:235-322 (Aug.) 1943

Effects of Estrone on Ovary of Mouse. W. S. Bullough.—p. 235.
Studies on Parathyroid of Mouse: I. Cytology of Normal Gland in Relation to Its Secretory Activity. C. L. Foster.—p. 244.
Comparative Action of Stilbestrol and Estrone on Body Growth and on Weight and Gonadotropin Content of Hypophysis. F. E. Emery.—p. 254.
Reaction of Uterine Epithelium of Rat to Estrogenic Stimulation. E. S. Horning.—p. 260.
Induction of Superovulation and Superfecundation in Rabbits. A. S. Parkes.—p. 268.
Cyclical Changes in Skin of Mouse During Estrous Cycle. Helena F. Bullough.—p. 280.
Rate of Absorption of Esters of Estrone and Estradiol as Determined by Feather Tests. A. S. Parkes.—p. 288.
Role of Adrenal Cortex and Anterior Pituitary Gland in Induced Secondary Shock Symptoms. M. Reiss, L. D. MacLeod and Y. M. L. Golla.—p. 292.
Effect of Various Hormones on Chemical and Physical Properties of Bone. G. H. Bell and D. P. Cuthbertson.—p. 302.
Production of Ovulation in Hypophysectomized Rats. I. W. Rowlands and P. C. Williams.—p. 310.
Urinary Excretion of Estrogens Following Injection of Proestrogens in Guinea Pig. C. W. Emmens.—p. 316.

Journal of Royal Naval Medical Service, London

29:153-224 (July) 1943

*Postarsenical Jaundice and Dermatitis: Survey of Records from St. Thomas's Hospital, 1929-1941. T. Anwyl-Davies.—p. 153.
Arsenoxide (Mapharsen) versus Neoarsphenamine. S. F. Dudley.—p. 170.
Investigation into Incidence of Trachoma in Maltese Islands, Its Early Diagnosis and Mode of Spread with Special Application to the Armed Forces. D. P. Gurd.—p. 171.
Painful Feet. R. M. Latta.—p. 182.
Sciatic Pain. H. L. Hoffman.—p. 184.
Lookout Problem in Submarines: Defective Night Vision. A. F. M. Barron.—p. 189.
Serologic Tests for Syphilis in Personnel of Large Ships Under War Conditions. R. P. Crick.—p. 196.
*Typhoid Infection in the Inoculated. W. I. D. Scott.—p. 198.

Postarsenical Jaundice and Dermatitis.—Anwyl-Davies shows that to become spirocheticidal the neoarsphenamines must be oxidized in the body. They contain from 18 to 21 per cent of arsenic. On exposure to air and to heat they undergo a change and then are rendered highly toxic. The solutions

must be fresh and cold and must be injected immediately after preparation. Arsenoxide (mapharsen) is believed to be the active spirocheticidal principle and so does not require converting in the body to become spirocheticidal. It is believed to be the first product of the breakdown of arsphenamine in the tissues and invariably contains 29.01 per cent of arsenic. When stored dry and under cool conditions it is stable, but when exposed to air and moisture it is gradually oxidized to less toxic pentavalent compounds and so, in direct contrast to solutions of neoarsphenamine, does not become more toxic either in the body or while standing in solution. Of 1,946 patients treated with neoarsphenamine, 574 developed jaundice and 134 dermatitis; total, 35.65 per cent. Of 1,147 patients treated with mapharsen, 146 developed jaundice and 14 dermatitis; total, 13.95 per cent. Mapharsen gave the lowest percentage of intolerance (13.95 per cent) and the shortest average illness of 18.7 days per attack of jaundice compared with the other arsenicals, and its substitution for the neoarsphenamines has considerably reduced the mortality rate. One death occurred for 20,467 injections of mapharside against one death for 5,660 injections of neoarsphenamine. Some patients that have had jaundice following the neoarsphenamines subsequently tolerated mapharsen. Mapharsen, while being a more efficient remedy, appears to be less toxic than the neoarsphenamines. Age and seasonal factors in the causation of jaundice and dermatitis appear to be negligible.

Typhoid Infection in the Inoculated.—Scott reports an epidemic of typhoid which had occurred among a group of inoculated naval ratings in a country where the infection is endemic. A higher percentage of contacts acquired the disease than might be expected among the inoculated. A concurrent epidemic of dengue made diagnosis difficult, particularly in the early stages; and failure to culture the organism, except in 1 case, enhanced the importance of the combination of clinical and serologic features. The course of the disease was atypical in many cases. There was no mortality, and toxic features predominated over those of virulence. The total number of inoculations was more important in determining the course of the disease than the recency of inoculation. Interesting clinical features included a high incidence of myocarditis and two virtually apyrexial patients, one diabetic. Typhoid H agglutinins in a titer of 1:125 or above were of some value in diagnosis. A completely negative result was not significant. There was a rise in the average titer of typhoid and paratyphoid H agglutinins in inoculated ratings who had recently suffered from a nonspecific febrile illness. Typhoid O agglutinins in a titer of 1:50 or less were present only in cases of clinical typhoid. Vi agglutinins were less valuable in the positive diagnosis of typhoid than O agglutinins. Their presence usually indicated an Eberthella typhosa infection, and they were found to persist up to at least six weeks after subsidence of the main symptoms. A positive Vi reaction was not proved to indicate the presence of living typhoid bacilli in the body, and extensive application of the test failed to detect a healthy carrier among those giving a positive result. Recent inoculation failed to produce agglutinins to Salmonella paratyphi B in a majority of cases.

Revista de la Asoc. Méd. Argentina, Buenos Aires

57:343-412 (June 30) 1943. **Partial Index**

*Tracheobronchial Lesions in Primary Tuberculosis. L. Sayé, A. Bence, A. Bottini, C. Emiliani, D. Fernandez Luna and J. C. Dighiero.—p. 343.

Amebic Hepatitis and Rheumatic Pericarditis. M. del Sel.—p. 355.

Tracheobronchial Lesions in Primary Tuberculosis.—Sayé and his associates report 10 cases of primary tuberculous infection observed in children and adults in which bronchoscopic examination revealed bronchial or tracheobronchial lesions of different nature such as congestive and hemorrhagic areas, ulcers, submucous infiltration, and ulcerating and nonulcerating granulomas. In all cases but one the tracheobronchial lesions were diffuse and extensive. There was a definite correlation between these lesions and the radiologic signs of atelectasis. The tracheobronchial lesions not only are responsible for immediate complications but may lead, if neglected, to cicatricial processes and residual bronchiectasis. In 3 cases treated with gold salts a considerable reduction or complete disappearance of the bronchial lesions was obtained in four to five months with consequent patency of the bronchial tracts. The authors advise bronchoscopic examination in every case of primary infection.

Revista Chilena de Pediatría, Santiago

14:391-468 (June) 1943. **Partial Index**

Treatment of Angiomas by X-Rays. A. Rahausen and J. Abud O.—p. 391.

*Meningococcic Infection of Joints. H. W. Jaeger.—p. 414.

Meningococcic Infection of Joints.—According to Jaeger the meningococcic arthritis is an early feature of the hematogenous invasion. Thirty-seven (3.70 per cent) cases of meningococcic arthritis were encountered among 1,000 cases of meningococcic infection. The wrists and the knees were the joints most frequently involved. In about 60 per cent of the cases more than one joint was affected. The meningococcic infection of the joints is not limited to the articular surfaces but involves also the surrounding structures. Two cases of meningococcic purulent bursitis and tenosynovitis were casually found at necropsy and they are the first cases reported in the literature. The incidence is evenly distributed between the two sexes and among all age groups. The treatment failed to modify the clinical course of the arthritis. High doses of sulfapyridine and sulfadiazine had no influence on the joint infection even when it cured the meningococcemia and the associated meningitis.

Revista Clínica Española, Madrid

8:219-298 (Feb. 28) 1943. **Partial Index**

*New Method for the Experimental Production of Thiamine Deficiency. J. A. De Loureiro and I. Rodrigues.—p. 235.

Clinical Importance of the Uniform Activity of Digitalis Drugs. T. A. Redonnet.—p. 248.

Experimental Production of Thiamine Deficiency.—Based on William's sulfite cleavage of thiamine, Loureiro and Rodrigues developed a practical and simple way of obtaining thiamine deficient diets. By treatment with sulfur dioxide, thiamine was entirely destroyed in the diet and the sulfur gas was easily disposed of. The basic diet used contained casein, flour, bakers' yeast, salts and cod liver oil. If both casein and yeast were treated by sulfur dioxide, the diet, administered to rats, caused an acute deficiency with death in three weeks. If only the yeast was sulfur treated the deficiency was subacute with severe symptoms of polyneuritis and death in five to six weeks. When thiamine was added to these diets the rats grew normally, showing that, with the exception of thiamine, all water soluble vitamins were unaffected by sulfur dioxide treatment.

Revista de la Facultad de Medicina, Bogotá

11:567-630 (April) 1943. **Partial Index**

*Concentrated Convalescent Serum in the Treatment of Exanthematic Typhus, Mumps, Measles and Chickenpox. A. Macchiavello.—p. 567.

Concentrated Convalescent Serum in the Treatment of Typhus, Mumps, Measles and Chickenpox.—A simple method is described for the concentration of convalescent blood serum. The procedure consists of drying the serum in a cellophane bag in a vacuum followed by filtration. This concentrated serum was shown to offer some protection against exanthematic typhus. In a group of 50 persons who were susceptible typhus contacts only 2 acquired the disease. Thirty-four persons exposed to mumps were treated with the concentrated convalescent serum and none of them developed the disease. In a control group of 90 persons not treated 40 per cent developed mumps. When the serum was administered to 8 children with the disease, immediate regression of all local and general symptoms occurred. In measles the serum gave definite protection to exposed children and when administered early in the disease the so-called modified or attenuated form developed. Similar results were observed in a few cases of chickenpox. In all instances the dose given was 2 cc. for infants up to 1 year of age and 0.5 cc. more for each additional year.

Archiv für Kinderheilkunde, Stuttgart

125:65-112 (Feb. 27) 1942. **Partial Index**

*Treatment of Epidemic Meningitis Without Meningococcus Serum. Ilse Bauer.—p. 65.
Experiences with a Diagnostic Tuberculin Plaster. E. Heinz.—p. 71.
Syphilis Connatalis: Case. W. Abegg.—p. 88.

Treatment of Epidemic Meningitis Without Meningococcus Serum.—Bauer reports observations on 68 infants and children with epidemic meningitis, who were treated during the years between 1936 and 1940. Meningococcus serum was given to none of these children because its use had been discontinued for lack of efficacy. The children were treated with blood transfusion, with sulfapyridine or with a combination of these two. The combined treatment reduced the mortality rate to 3.2 per cent. When blood transfusion and sulfapyridine were given at once without waiting for the bacteriologic confirmation of the diagnosis the results were even better. The combination treatment reduced the duration of the disease as well as the action of the bacterial toxins and of the inflammatory manifestations. The author regards the combined treatment with blood transfusion and sulfapyridine as the method of choice in epidemic meningitis.

Deutsche medizinische Wochenschrift, Leipzig

68:393-416 (April 17) 1942. **Partial Index**

*Sulfonamide Therapy in Otogenous and Rhinogenous Meningitis. W. Tonndorf.—p. 393.
Prophylactic External Cephalic Version in Pelvic Presentation. W. Reifferscheid and W. Vent.—p. 396.
Storage and Warming Up of Boiled Foods with Regard to Preservation of Vitamins. C. Dienst.—p. 400.
Early Diagnosis of Cardiac Lesions. H. C. Landen.—p. 403.
Differential Diagnosis of Tumor-Like Silicosis. K. Zech.—p. 405.
Pathologic Changes in Course of Time. H. Hamperl.—p. 407.

Sulfonamide Therapy in Otogenous and Rhinogenous Meningitis.—Tonndorf treated 21 patients with otogenous and 3 patients with rhinogenous meningitis by excision of the primary focus, by lumbar puncture and by intraspinal, intramuscular and oral administration of p-amino-benzene sulfonacetamide (albucid). The minimum dose given was 17 Gm. within eleven days to a boy 8 years of age, while the maximum dose given was 148 Gm. within forty days to a man aged 41. Eight of the 24 patients died and 16 recovered. Three out of seven patients who were unconscious on admission recovered. Recovery occurred in 2 cases in which a cerebral abscess developed. Eleven patients with acute suppurative middle ear and 3 patients with chronic suppuration of the middle ear and labyrinthitis recovered. Recovery in all cases was slow and in some instances was interrupted by a relapse. Equally good results were obtained by Unterberger, who reports 25 recoveries out of 39 cases of otogenous meningitis.

68:441-472 (May 1) 1942. **Partial Index**

*Cachectic Edema in Diffused Glomerulonephritis. W. Nonnenbruch.—p. 442.
Causes of Hypertension in Essential Hypertension. A. Rühl—p. 445.
Psychotherapeutic Treatment of Hypertension. J. H. Schultz.—p. 453.
*Hypertension in Youth and Its Evaluation. H. Sarre.—p. 457.
*Pathogenesis and Treatment of Disturbances of Myocardial Blood Perfusion. W. Kampmann—p. 461.

Cachectic Edema in Diffused Glomerulonephritis.—Nonnenbruch reports 4 cases of diffuse glomerulonephritis in which a soft, general edema combined with hypoproteinemia, a shift in the blood albumin picture to the left and lipoiduria suggested amyloid nephrosis or diffuse glomerulonephritis with a nephrotic syndrome. Cachexia of tissues due to some other process than the nephritic syndrome was considered to be responsible for the peculiar character of the edema. The absence of lipemia was decisive in the differential diagnosis. A sparing diet is contraindicated in these cases and hunger-thirst therapy should be limited to the shortest possible period and then be replaced by a diet rich in albumin. Recovery resulted in 1 case on a diet rich in calories and albumin instituted while hypertension and edema were still present. Improvement occurred in the 3 other cases. Apparently tissue condition determines the type of edema.

Hypertension in Youth.—The general importance of hypertension in youth for military or labor service is overestimated. A considerable number of men with hypertension are persons with labile blood pressure. Any sort of excitement may be the cause of their hypertension. Their functional capacity is not reduced. One should look for the basic disease in cases in which hypertension has become fixed. Diastolic pressure above 80 mm. of mercury should be considered an alarming symptom. In many such cases renal hypertension or types secondary to chronic nephritis, malignant sclerosis, cystic kidney, pyelonephritis, kidney anomalies or hypertension after trauma may be demonstrated. There will be a few instances of essential hypertension in youth. The prognosis in these cases will be favorable in the absence of changes in the fundus oculi and of subjective disturbances such as headache or vertigo. Most of the time these persons will be able to work and a benignant course of hypertension is to be expected.

Pathogenesis and Treatment of Disturbances of Myocardial Blood Perfusion.—Kampmann discusses disturbances of myocardial blood perfusion of coronary and other origin. Sclerosis and thrombosis of coronary arteries resulting in narrowing of the arterial lumen or in complete obstruction are frequent instances of the first group, but coronary stenosis may also be purely functional, as in malignant sclerosis, pale hypertension or chronic nephritis. Good results were obtained in all types of myocardial disturbances of coronary origin by restriction of fluid intake, strict dechloridation and administration of strophanthin and digitalis preparations. Administration of acetylcholine is recommended in acute cases of coronary contraction. Special reference is made to disturbances of myocardial blood perfusion previous to or during the menopause. Functional myocardial capacity was restored almost completely by regular and prolonged administration of sufficiently high doses of the follicle stimulating hormone.

Klinische Wochenschrift, Berlin

21:489-512 (May 30) 1942. **Partial Index**

Aspects of Mitral Stenosis. E. Edens.—p. 489.
Vitamin Economy in Newborn and Nurslings and Its Behavior During the Growth Period up to Maturity. H. Brieger.—p. 491.
*Epidemiology of Typhus. H. Klose.—p. 498.
*Some Observations on Clinical Aspects of Typhus. G. Liebau.—p. 500.
Investigations on Thymus Hormone with Particular Reference to Status Thymicolymphaticus. C. Bomskov.—p. 502.

Epidemiology of Typhus.—Klose shows that effective destruction of lice in regions where typhus is prevalent is one of the most important procedures in the war on typhus. It is important to destroy not only the lice and their eggs but also their highly infectious excreta. The feces of lice rather than their bite is most dangerous. This has been proved by investigators and the author found it corroborated by observations in a delousing station for Russian war prisoners among whom typhus had broken out. Of the delousing personnel 78.2 per cent contracted typhus, although they were never found to harbor lice and regularly went through the delousing process. Typhus was contracted by a physician who lived in surroundings that were entirely free from lice, and who vaccinated only deloused Russian war prisoners. A man active as clerk in an office located away from the prisoners' camp likewise contracted typhus after he had worked on a card index from the camp. He had never been inside the camp and he and his surroundings were entirely free from lice. Two French prisoners of war contracted typhus after they had passed through the same delousing station which had been used by Russian prisoners among whom typhus had existed. The author thinks that the bite of infected lice could be ruled out in all these cases. He reasons that these infections must have been caused by the fecal excreta of typhus infected lice. In the dried excreta of lice the rickettsias remain viable for a long time. Whether rickettsias can enter the skin when lice excreta reach it in dust form or whether inhalation or some other ways are responsible still remains to be explained. At any rate delousing by hydrocyanic acid apparently does not kill rickettsias in the dried excreta of lice and therefore is inadequate for delousing. Hot air, currents of steam and chemical substances, when properly used, will kill rickettsias, for they proved effective during the first world war.

Clinical Observations on Typhus.—Liebau reports the development of typhus in 23 of 25 men of the watch force of a camp for typhus infected Russian prisoners of war. The men were between the ages of 26 and 40 and in excellent physical condition. They could bathe and change their linen

daily and they received added rations. Thus typhus was contracted by men who lived under favorable conditions, whereas typhus usually spreads in the presence of hunger and unhygienic conditions. The mortality remained comparatively low, there being only two fatalities. It is generally believed that the bite or the excreta of lice are the exclusive source of typhus, but the fact that the physician taking care of the aforementioned 23 patients contracted the disease after four weeks and never had contact with lice or their excreta seems to suggest that blood smear infection was responsible in his case. The titer of the Weil-Felix reaction varied between 1:200 and 1:20,000. The height of the titer did not parallel the severity of the clinical picture. Comparative Weil-Felix tests on the medical and nursing personnel revealed titers between 1:100 and 1:400 in 5 of 21. Of 50 soldiers who never had had contact with typhus patients 4 gave Weil-Felix titers of 1:100. The author thinks that the generally accepted belief that a titer 1:200 definitely indicates typhus requires closer inspection. The author observed considerable anemia in the majority of patients. Electrocardiographic studies revealed the possibility of late cardiac lesions. Impairment of the acoustic nerve with hardness of hearing was observed in nearly half of the patients. The treatment of typhus is still chiefly symptomatic. The author's patients found one or two daily baths of 37 to 40 C. gratifying. Dryness in the throat was counteracted by infusion of isotonic solution of sodium chloride, vaporization of the room or inhalation. The diet should be fluid or puréed but not too low caloried. Generous amounts of fruit and vitamin C and B_1 were given.

Münchener medizinische Wochenschrift, Munich

89:71-92 (Jan. 23) 1942. **Partial Index**

Contribution to Problem of Cancer. W. Brünings.—p. 71.
*Etiology of Epidemic Hepatitis. H. Voegt.—p. 76.
Modern Therapy of Cancer. G. Will.—p. 79.
New Knowledge About Causes and Treatment of Spontaneous Abortion. W. Schultze.—p. 82.

Etiology of Epidemic Hepatitis.—According to Voegt the majority of investigators assume an infectious origin for epidemic hepatitis, either bacterial or virus in nature. Transmission experiments from man to man were carried out by Carelli and also by Lainer with negative results. Voegt gave each of 4 persons by mouth 5 cc. of duodenal juice from a patient with epidemic hepatitis. After nearly four weeks these persons exhibited signs of hepatic impairment. One of them had a subicterus of the skin and scleras. Since some reports indicate that epidemic hepatitis can be transmitted by infected human vaccines or convalescent serums, the author investigated the effect of subcutaneous or intramuscular injections of serum, plasma or hemolyzed erythrocytes on 6 additional persons, the material being obtained from patients with epidemic hepatitis. One man developed a subicterus and he and another man showed increase in the bilirubin content and a positive Takata reaction. Four women had positive Takata reactions and other signs of hepatic disturbance. The author concludes that, although he did not succeed in producing the complete picture of epidemic hepatitis, all the persons tested developed clinically demonstrable signs of hepatic impairment and a picture which resembled epidemic hepatitis.

89:161-184 (Feb. 20) 1942. **Partial Index**

*Infectious Icterus (Epidemic Hepatitis). K. Gutzeit.—p. 161.
Mortality of Pneumonia as Measure of Value of Treatment. W. Batschwarow.—p. 164.
Experiences with Lumbar Sympathectomy in Endangiitis Obliterans of Vessels of Legs and Feet. F. Schörcher.—p. 166.
Temporary Exclusion of Sympathetic in Treatment of Ulcers of Extremities. D. Philippides.—p. 174.

89:185-206 (Feb. 27) 1942. **Partial Index**

*Infectious Icterus (Epidemic Hepatitis). K. Gutzeit.—p. 185.
Diagnosis and Treatment of Trachoma. W. Meisner.—p. 190.
Precancerosis of Colon and Rectum. H. Westhues.—p. 192.
Renal Impairment Following Use of Sulfapyridine. R. Enger and H. Wendel.—p. 196.

Infectious Icterus (Epidemic Hepatitis).—According to Gutzeit, Weil's disease and the so-called field, swamp or harvest fever are caused by organisms of the genus Leptospira. The major part of the discussion is concerned with a third type of icterus, the infectious nature of which can be regarded as established although its etiologic agent is still unknown. The author calls attention to increased frequency of epidemic hepatitis during wars. It appears particularly among soldiers. The clinical picture is characterized by three stages: the febrile, the gastrointestinal stage, which is followed by a phase of relative improvement, and the icteric phase, during which the gastrointestinal symptoms become prominent once more. In some cases jaundice fails to appear or is so mild that it is not recognized. The majority of cases remain mild and uncomplicated, but occasionally epidemic hepatitis may be followed by acute yellow atrophy. The generally slow increase in epidemic curves and the fact that they never occur with explosive suddenness indicate that water and food infections are not responsible. The question arose whether the disease might not be a sequel of dysentery or paratyphoid. On military fronts where the jaundice appeared Flexner dysentery had often preceded it by one or two months. Some of the men who developed jaundice had had dysentery, but others had not. The etiologic significance of dysentery is contradicted by the fact that at the time of the greatest prevalence of dysentery in Greece and Russia there was no jaundice. Although there have been occasional agglutinations with paratyphoid in patients with epidemic hepatitis, bacteriologic and serologic investigations were generally negative. Transmission experiments suggest the virus nature of the agent. Epidemic hepatitis likewise occurs after injection of convalescent measles serum, of yellow fever vaccine and of smallpox vaccine. Rest in bed and dietetic measures are most important in the treatment of the condition.

Zentralblatt für Chirurgie, Leipzig

69:769-816 (May 9) 1942

Effects on Speech in 300 Plastic Operations on Palate. G. Axhausen.—p. 770.
Intrathoracic Bronchial Cysts: Operation on Giant Bronchial Cyst. H. Klose.—p. 776.
*Spontaneous Cure of Malignant Myeloma. G. Beyer.—p. 781.
Fibrosclerotic Peripyelitis a Rare Entity. H. Dieckow.—p. 790.
Two Cases of Total Umbilical Fistula. A. Cserey-Pechány.—p. 795.
*Spontaneous Perforation of a Swallowed Needle Through Abdominal Walls Without Suppuration and Peritoneal Symptoms. N. Guntscheff.—p. 797.

Spontaneous Cure of Myeloma.—Beyer reports the history of a man aged 65 who had a plasmacellular myeloma in one clavicle and in one rib. The focus in the clavicle was removed but the patient refused the removal of the other lesion. The period of observation was about two years. During this time no relapse occurred in the clavicle, and the focus in the rib regressed spontaneously. This case raised the question of the pathologic nature of the myelomas. On the basis of the microscopic structure of the removed myeloma, the author agrees with those who classify myeloma with the malignant growths. Even if myeloma is regarded as a systemic disease it must be admitted that it has the behavior of a malignant neoplasm; it has an expansive, infiltrative and destructive growth, it may cause metastases and it is frequently fatal. With regard to the case under consideration, the question arises whether the cure of the costal tumor represents the spontaneous cure of a second primary tumor or the dying out of a metastasis following removal of the primary neoplasm. That the two tumors appeared simultaneously and that myelomas are often multiple and rarely produce metastases speak against the metastatic character of the costal tumor, but the cure could speak for the metastatic nature. If, however, the costal neoplasm is a second primary tumor, the spontaneous cure is even more surprising.

Perforation of Swallowed Needle Without Peritoneal Symptoms.—Guntscheff reports the case of a boy of 14 months who had swallowed a needle 5 cm. in length. During the ensuing days the food intake was small and the child lost weight. Between the seventh and eighth days the eye end of the needle appeared in the skin. It had spontaneously perforated the abdominal walls. There was no secretion from the perforation canal, and peritoneal symptoms did not appear.

Book Notices

The Dental Treatment of Maxillo-Facial Injuries. By W. Kelsey Fry, M.C., M.R.C.S., L.R.C.P., Consulting Dental Surgeon to the Royal Air Force, P. Rae Shepherd, L.D.S., R.C.S., Dental Surgeon, East Grinstead Maxillo-Facial Unit, Alan C. McLeod, D.D.S., B.Sc., L.D.S., Dental Surgeon, East Grinstead Maxillo-Facial Unit, and Gilbert J. Parfitt, M.R.C.S., L.R.C.P., L.D.S., Dental Surgeon, East Grinstead Maxillo-Facial Unit. With foreword by Professor F. R. Fraser, M.D., F.R.C.P., Director General, Emergency Medical Service. Cloth. Price, $4.50. Pp. 250, with 333 illustrations. Philadelphia & Montreal: J. B. Lippincott Company, 1943.

The authors have had a wide experience in the treatment of fractures of the jaws both in civilian and in military practice. The present volume is based chiefly on the work of the maxillofacial unit at the East Grinstead Military Hospital in England. Pathologic considerations in maxillofacial injuries receive adequate attention, and complications such as infection, shock, hemorrhage and associated head lesions are given due consideration. The greater part of the book is concerned with the diagnosis and various methods of fixation of fractures of the jaws. Every conceivable type of jaw fracture is mentioned and discussed in detail, and the appropriate methods of fixation for each are described. While the authors include a description of treatment by the use of dental wire ligatures, for most fractures in military practice they show a distinct preference for metal cap splints on the teeth. Provided as they are with adequate facilities and experienced technicians for the construction of these appliances, their preference is not surprising, although the alleged damage to teeth by the use of wires is somewhat exaggerated. Adequate but cautious attention is given to the use of skeletal pin fixation for fractures of the mandible. The book is highly recommended as virtually indispensable to those who expect to care for large numbers of jaw fractures in military practice.

Anopheles Gambiae in Brazil 1930 to 1940. By Fred L. Soper and D. Bruce Wilson. Cloth. Pp. 262, with 75 illustrations. New York: Rockefeller Foundation, 1943.

In describing the invasion of Brazil by Anopheles gambiae in 1930, the devastating outbreak of malaria caused by it in 1938 and the ultimate eradication of the species from its spreading focus in northeastern Brazil, Soper and Wilson have described, albeit in scientific form, one of the most dramatic episodes in public health history. Few persons outside the devastated area were aware during this period that the fate of a large section of the Western Hemisphere hung in a delicate balance, menaced by the most serious disease threat of its history. The authors, who played a vital role in the successful campaign to bring A. gambiae under control and later to exterminate it from its "beachhead" in the Western Hemisphere, have written an authoritative and semiofficial account of this program, carried on jointly by the Brazilian government and the Rockefeller Foundation. After a brief description of A. gambiae and its habits and of the terrain of northeastern Brazil, there follows an account of the discovery of the species around Natal in 1930 and its spread and ultimate fatal invasion of the states of Ceara and Rio Grande do Norte, where it accounted for 15,000 to 20,000 deaths in one season. The bulk of the volume deals with the successful control program. The volume is of tremendous value in recording for posterity the details of a noteworthy public health accomplishment. As such it is one of the most valuable documents published in years and merits the careful study of all students of public health. Of even greater significance is its value in showing what can be accomplished in the field of disease prevention if funds and public support are provided. It is to be regretted that the volume will not be read by all who are responsible for determining public policy, politicians as well as scientists.

Kinetic Bandaging Including Splints and Protective Dressings: The Kinetic Method of Visual Teaching. By Seymour W. Meyer, B.S., M.S., M.D. Cloth. Price, $3.50. Pp. 310, with 540 illustrations. Philadelphia: F. A. Davis Company, 1943.

The simplicity of style makes this book of great value in teaching. The diagrams are instructive. The demonstrations are easily understood. The illustrations are clear and concise. Each turn of bandage is numbered so that its position and course can be easily followed. The book should be of value to Army and Navy Medical Corps, Red Cross workers, general practitioners, interns, medical students, nurses and laymen. The author perceives the human body as a composite of but three geometric figures, viz. ovoids, cylinders and truncated cones. He divides the body into fifteen parts, which fall into these three categories. The fundamental principles applicable to each group are given in detail. The illustrations contain numbers of each constituent of the bandage, and arrows indicate their directions. The description of the scultetus binder—its manufacture, uses and technic of application—are excellent. The Velpeau dressing is clearly demonstrated. The numerous uses of the triangular bandage are illustrated. Adhesive plaster dressings are added. The sections on splints might have been omitted without loss. In the section on plaster of paris the author made an unfortunate choice of cast cutter. In many capable hands it is a dangerous instrument.

Personal and Community Health. By C. E. Turner, A.M., Sc.D., Dr.P.H., Professor of Public Health in the Massachusetts Institute of Technology, Boston. Seventh edition. Fabrikoid. Price, $3.50. Pp. 585, with illustrations. St Louis: C. V. Mosby Company, 1943.

This book is prepared for students at various college levels. It is a comprehensive extensively documented treatise on personal and community phases of modern health problems. Its approach is that of combined anatomy, physiology and hygiene. The effort is made in each instance, of which the discussion of digestion is a typical example, to furnish the necessary information on structure of the organs comprising the digestive system, their function and interrelationship and the hygiene of living in the light of these facts. A similar approach is employed for each of the principal bodily functions. The chapters on nutrition, digestion, respiration, mental hygiene, foot hygiene, heredity and health, narcotics and stimulants, to choose but a few from the section on personal health, indicate the functional approach of the book. In part II, dealing with community health, a similar approach is maintained. As in previous editions, the book is comprehensive and accurate. It has been improved over previous editions in more modern approach to illustrations and in readability. A particularly valuable feature is the extensive and well selected list of references at the end of each chapter. Tables and diagrams, as well as photographic illustrations, are numerous, clear, attractive and well labeled. A few well selected color plates add greatly to the book.

Handbook on Physical Fitness for Students in Colleges and Universities. Prepared by a committee appointed by the U. S. Commissioner of Education with the collaboration of the U. S. Army, the U. S. Navy, the U. S. Public Health Service, and the Physical Fitness Division of the Office of Defense Health and Welfare Services. Federal Security Agency, U. S. Office of Education. Paper. Price, 25 cents. Pp. 140, with illustrations. Washington, D. C.: Supt. of Doc., Government Printing Office, 1943.

The committee which prepared this pamphlet on physical fitness is composed predominantly of men and women interested primarily in physical education and physical training rather than of physicians and physiologists. The contents, consequently, emphasize the technical aspects of sports and exercises and their immediate effect on the muscular and physical development of men and women. This handbook should be of special value to the physical educators for whom it is unquestionably designed, and it will be a useful reference also for physicians on whom the ultimate responsibility for the prescribing and limiting of violent physical exertion should rest.

Biology of Acarus Scabiei. By Reuben Friedman, M.D., Associate Professor of Dermatology and Syphilology, Temple University School of Medicine, Philadelphia. Cloth. Price, $3. Pp. 183, with 112 illustrations. New York: Froben Press, 1942.

This has many excellent features. It is timely because scabies always assumes greater importance in wartime. The book is rich in references and in illustrations. The historical facts are critically considered and presented in an interesting manner and all knowledge of the subject is brought down to date. Because of its limited scope, it will have particular value as a source book only for those interested in entomology; the general reader, however, will find it worthwhile reading just as were the author's companion books The Emperor's Itch and Scabies, Civil and Military.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

RELAXED INGUINAL RINGS AND HERNIA

To the Editor:—**There has been much discussion of relaxed inguinal rings. Da Costa's Surgery (ed. 9, p. 1124) states that "in a healthy man the external ring should admit the tip of the little finger but not that of the index finger. If the end of the index finger can be made to enter the ring that aperture is dilated and, even if there is no hernia in the canal, in the future a hernia will probably descend." If this was to be followed as a standard, then a large percentage of inguinal rings would probably be classified as relaxed. I have seen men, turned down by one branch of the service because of so-called relaxed rings, promptly accepted at induction centers by the Army. Some of us have passed men for industrial plants or on preliminary physical examinations for selective service, only to have them turned down in turn by induction centers because of relaxed rings. Recently one of us was asked to examine a man who had spent ten months in the Army, been discharged to the enlisted reserve because he was over 38 and who then had taken a physical examination for the volunteer Coast Guard Auxiliary. He was told by the examining physician (U. S. P. H. S.) that he had relaxed rings; these same rings had survived two army examinations and were not relaxed in the opinion of the private physician consulted. 1. Should persons with inguinal rings which readily admit the index finger and produce a moderate impulse on coughing be classified as having relaxed rings and be required to wear a belt, such as the McIntosh, if engaged in work of a strenuous nature? Should they be considered as potential subjects of hernia from an industrial standpoint? 2. When a small hernia exists (ring enlarged and on coughing visceral impulse felt which follows finger on withdrawal) will the wearing of a support of the McIntosh type prove of much help as far as further progression is concerned if the man is engaged in work which requires a fair amount of effort? 3. Do a large percentage of those in the upper age brackets (50 and over) have relaxed rings and relaxed inguinal support in general as an incident of age? Should individuals in this age group be required to wear a McIntosh belt if the rings are relaxed and they are to engage in fairly strenuous activities? 4. Should young persons with small asymptomatic congenital umbilical hernias be required to wear a support if engaged in strenuous work? Does the same apply to those of moderate size? To add to the confusion, frequently a man will be told in one industrial plant that he has relaxed rings and when he changes employment later is passed in another plant as having normal rings.**

M.D., Louisiana.

ANSWER.—The question of what constitutes a relaxed inguinal ring and the question of the possibility of the development of a hernia in the future cannot be answered categorically. In these problems one must rely heavily on clinical experience and judgment. A number of factors must be considered, such as the age of the patient, the general health of the patient, the muscular development of the abdominal wall, obesity, constipation and other conditions which tend to affect the intra-abdominal pressure.

Most surgeons today do not subscribe to Da Costa's opinion with regard to determination of a relaxed inguinal ring by the finger test. An external inguinal ring may admit two fingers and may not lead to the development of hernia. The question of the development of an indirect inguinal hernia is determined by the degree of obliteration of the processus vaginalis testis and the development of the abdominal musculature. The existence of an inguinal hernia is best determined by seeing a bulge on coughing or on asking the subject to spread his leg wide and then to lift a weight. If no impulse (bombardment) is felt by the examining finger within the ring while the subject is coughing, the question of hernia need not be considered.

In answer to the specific questions: 1. Such a person does not require the wearing of a truss. The term "potential hernia" is not admissible. Every human being may be considered to have "potential hernia."

2. A properly applied truss would be indicated, for it would at least prevent further descent and possible strangulation. However, the proper treatment for "a small hernia" is the operative treatment.

3. A large percentage of people in the upper age brackets have relaxed rings and relaxed inguinal support. They need not wear a truss, since the truss will not affect the development of a hernia if one is going to take place.

4. Small, asymptomatic, congenital, umbilical hernia in men doing strenuous work constitutes an indication for a properly applied belt. Men with "moderate size" umbilical hernia should be treated by operative intervention.

TREATMENT OF SAPHENOUS PHLEBITIS

To the Editor:—**Recently I saw a man with thrombophlebitis of the internal saphenous vein which extended from the right midthigh to the fossa ovalis, where there was a swollen, indurated mass about 1 inch in diameter which was part of the aforementioned vein. At the time I saw the patient the lesion was quiescent, as there was no fever or leukocytosis and there was no redness or swelling about the vein. The patient had had varicose veins in the left leg for fifteen years and for the past five years he had had some swelling of ankle and pain in leg on standing for any length of time. About three weeks ago he began to have severe pain and tenderness along the inner aspect of the right thigh, which persisted for five to six days and then gradually began to subside. He stated that previous to the present illness he was able to squeeze out the lump in his thigh but after this illness the lump became hard and could not be reduced. It is my belief that the patient had a varix in the internal saphenous vein just as it entered the fossa ovalis and that it became hard following the thrombophlebitis. At present there is a hard, cordlike, tortuous structure which extends from this lump down toward the inner aspect of the thigh for a distance of 12 inches following the course of the internal saphenous vein. As far as I can make out there is no blood flowing through this at the present time. Should this be left alone since it is already quiescent? Should a ligation be attempted in order to prevent pulmonary complications in the event of an exacerbation of the thrombophlebitis? I should also like to have an opinion on the proper treatment of other similar cases of thrombophlebitis of the internal saphenous vein which do not rise quite so high. Should these patients have ligation and injection, and, if so, what would be the time interval after subsidence of symptoms, and what laboratory data would you suggest in addition to clinical evidence of quiescence? In the American Medical Association manual on varicose veins, ligation and injection of acute phlebitis are contraindicated but nothing is said of the management of the patient after subsidence of symptoms.**

M.D., Pennsylvania.

ANSWER.—The treatment of saphenous phlebitis occurring in preexisting varicosities differs in some respects from that employed in patients not suffering from phlebitis. Ligation of the saphenous vein at its junction with the femoral in the presence of saphenous thrombosis not only relieves pain but hastens the subsidence of inflammation and prevents early recanalization of the soft red thrombi. It is one of the clear-cut indications for ligation of the saphenous vein as indicated in the American Medical Association manual on varicose veins, table 1, page 16.

It must be realized, however, that the surgeon may encounter considerable periphlebitis, lymphangitis and enlargement of inguinal lymph glands in such a stage which make dissection more difficult. He may also find that the vein is thrombosed clear up to the saphenofemoral junction, which is often bulbous. If a thrombus is encountered at this level, the proximal stump should be aspirated with a suction tip, since thrombi may extend from the saphenous bulb into the femoral vein and float freely in the lumen or adhere to the wall.

While the ligation of the saphenous vein can and should be done in the acute stage, injections of any sort are better postponed until the periphlebitis, hyperemia and induration have definitely subsided; the injections activate a subsiding phlebitis and may prolong convalescence. To hasten the regression of phlebitis, elastic support, small doses of x-rays or injections of sodium tetrathionate are useful. The patient may be ambulatory after a day or two of hospitalization. Injections are started several weeks later, when the edema, hyperemia and induration around the superficial veins have subsided. The clinical findings are more valuable than any laboratory aid, but a sedimentation rate or a heparin tolerance test (*Surg., Gynec. & Obst.* **77**:31 [July] 1943) may be of some help to gage the activity of the process.

ALCOHOL INGESTION AND TREATMENT OF SYPHILIS

To the Editor:—**Would the ingestion of excessive amounts of alcohol daily appreciably affect the results of antisyphilitic treatment? Would the daily ingestion of excessive amounts of alcohol by a patient receiving antisyphilitic treatment for a period of two years be a cause for the persistence of a positive Wassermann reaction? The Wassermann reaction of a patient of mine who answers this description was 3 plus six weeks ago. At a clinic four weeks later she had another Wassermann test, after having ceased to drink alcohol as ordered, and the Wassermann reaction was negative. How would you explain this strange serologic reversal?**

M.D., New York.

ANSWER.—Except as far as excessive alcoholism may affect the patient's ability to adhere to a regular treatment schedule, there is no adequate scientific information that alcohol affects the therapeutic efficacy of antisyphilitic treatment.

Alcoholism is not cause for the persistence of a positive blood serologic test.

The reversal of the blood test in the patient described can be attributed to nothing more important than coincidence.

LATE NEUROSYPHILIS AND TRYPARSAMIDE

To the Editor:—Several problems have arisen concerning our antisyphilitic treatment and I should like an opinion on them. 1. Should a patient with dementia paralytica who for some reason or other (excluding definite sensitivity or kidney and liver disease) fails physically to the extent that he becomes bedridden or comatose be continued on tryparsamide treatment? It is assumed that the patient has not received his full fifty weeks of arsenicals. 2. If a patient with dementia paralytica has early optic atrophy, should he be given tryparsamide treatment if he has never had tryparsamide? 3. If a patient has complete optic atrophy with total blindness, regardless of etiology, should tryparsamide be given? 4. Is advanced age a contraindication to treatment?

M.D., California.

ANSWER.—1. The results of fever therapy for patients with dementia paralytica who have become bedridden and comatose have been in the main unsatisfactory. However, every now and then one such patient is materially improved by either malaria or hyperthermy. In a study reported by the subcommittee of the Cooperative Clinic Group, the comparative value of the two types of fever therapy showed that hyperthermy treatment followed by tryparsamide offered the patient with advanced dementia paralytica a higher incidence of improvement than did malarial therapy. If the patient has not had fever therapy, he would seem to be entitled to it, and if he has already had fever therapy the continued use of tryparsamide and a bismuth compound for a minimum of one hundred injections of each drug is warranted.

2. A patient with dementia paralytica who has evidence of early optic atrophy should not be given tryparsamide but preferably should be given the advantage of fever therapy followed by intraspinal measures. The combination of fever therapy and intraspinal treatment with either a soluble mercury or a bismuth preparation has offered the highest incidence of arrest of the loss of vision. This incidence approximates 15 per cent, and low as it seems to be it is apparently the safest program for patients of this type.

3. If the optic atrophy has advanced to the point of total blindness and the patient is manifesting signs of mental change, he may be given tryparsamide. On the other hand, if evidence of dementia paralytica is not present, in other words, an optic atrophy in association with tabes dorsalis, continued use of bismuth compounds or iodides and small doses of an arsenical are warranted. Tryparsamide should be limited to patients showing mental changes but not with early involvement of the optic tract.

4. Advanced age is not necessarily a contraindication to the use of tryparsamide. In fact, small doses of tryparsamide may be given to elderly persons with neurosyphilis of either the paretic or the meningovascular type with definite advantage. The dosage should be small and the patient watched carefully for objective and subjective visual complications.

SEVERE BACKACHE AND INFANTILE UTERUS

To the Editor:—A married woman aged 25 came to my office on Aug. 21, 1942 complaining of severe low back pain radiating into both lower quadrants. Examination was negative except for an infantile cervix and uterus and cervical os, which was almost completely occluded. The uterus was sharply anteflexed. I performed an electroconization of the cervix and dilation and curettage on Sept. 1, 1942. The patient enjoyed relief from all symptoms for a period of six months, at which time there was a recurrence of all symptoms. On June 16, 1943 the opening of the cervix would scarcely admit a fine examining probe and I repeated the previous operation and coned out the cervix to 1 cm. in diameter. She was relieved only slightly from this second operation. On Sept. 4, 1943 she came to my office and reported that all her previous symptoms had returned in greater severity than she had ever experienced. She stated that her last menstrual period was extremely painful and at the time of her last menstruation little menstrual fluid passed. The uterus remains small and in the same anteflexed position. The cervix remains small and I am unable to pass the smallest examining probe. Her suffering is so great that hysterectomy is being considered. Will you kindly advise any measure that I might employ to relieve her condition so that such radical procedure will be unnecessary?

D. K. Matthews, M.D., Dresden, Ohio.

ANSWER.—In spite of the fact that the patient's symptoms were absent for six months following the first electroconization, dilation and curettage, a careful examination including the use of roentgenograms should be made of the patient's back, bony pelvis, joints, legs and feet in order to rule out an orthopedic or other condition. The pelvic organs are by no means responsible for most backaches in women.

Before a hysterectomy is contemplated in a case like this, the following may be done: Under anesthesia (intravenous pentothal sodium will be satisfactory) the cervical canal should be dilated up to at least No. 10, preferably No. 12 Hegar dilator. Then a hard rubber or metal pessary of the Wylie type should be placed in the cervical canal and sutured in place. The pessary should be left in the cervix for three months. Almost certainly at the end of this time the cervical canal will be sufficiently large to permit the escape of blood without discomfort. During the time the pessary is in the cervix the menstrual blood will readily come out.

PROLONGED FEBRILE ILLNESS WITH POSITIVE WASSERMANN REACTION

To the Editor:—A woman aged 23 while a senior in college two years ago, majoring in bacteriology and handling live cultures of many different pathogenic organisms, suffered a gradual onset of malaise, joint pains and slight fever, which slowly became more severe. A complete and apparently adequate examination, including agglutination reactions for Brucella, Tularemia, Salmonella and other pathogens, was negative except that a palpable spleen and positive Wassermann and Kahn reactions were present. She was given two doses of arsenicals and developed an encephalitis (comatose for a week) which cleared up but left her with a partial hemiplegia. Soon after this, while still in bed, she developed pneumonia complicated by an empyema requiring a rib resection. In spite of all this she recovered but continued to have an enlarged spleen, almost daily temperature increases to about 102 F. with occasional bouts of joint pains and enlargements and a gradual loss of weight from 125 to 55 pounds (56.7 to 25 Kg.). At one time a course of chemotherapy, exact drug unknown, resulted in severe dermal reactions with great increase in temperature and oral and pharyngeal lesions suggesting a granulocytopenia, for which transfusions were given. After this a bismuth compound was given, but its administration resulted in much nausea and vomiting. Her serologic reactions for syphilis continued to remain strongly positive. Her fever and joint symptoms have continued for two years. The patient's parents are both in excellent health, clinically and serologically negative for syphilis; she has no siblings. There is no history suggestive of secondaries or of a genital or extragenital primary lesion. The patient, an intelligent, frank and alert young woman, states that she did not have any intercourse, and examination indicates that she is a virgin. Recent Wassermann and Kahn tests on two occasions showed strongly positive reactions. Examination now reveals quite a large spleen, severe emaciation, partial left hemiplegia and slight contractures of the joints on the right side, none of which are enlarged. Lymph nodes, heart and lungs, nose and throat and other systems are essentially normal. The patient is able to stand only momentarily and hence is confined to bed most of the time. An x-ray film of the chest taken a few months ago was said to be normal. Laboratory examination reveals hemoglobin 11 Gm. per hundred cubic centimeters and white blood cell count 8,700, with an essentially normal differential. Blood culture is negative. Blood agglutinations for Brucella, Salmonella, tularemia and dysentery organisms were negative. Several Mantoux tests made before I saw her were reported as negative. The patient has never been out of the state of Washington; hence malaria and other "tropical" diseases hardly need consideration. She has recently gained weight and felt somewhat better using physical therapy, high caloric diets, sedatives and antipyretics. In view of the prolonged course and other aspects I have about decided that rheumatoid arthritis is the most likely diagnosis and am arranging with her former bacteriology teacher to have a series of agglutination reactions with the various Lancefield types of streptococci. The questions I should like to ask are Does syphilis, "the great imitator," ever give such a clinical picture over such a prolonged time? Isn't it probable that the chronic infection present is causing the serologic reactions to be false positives? What other diseases besides abdominal Hodgkin's disease, histoplasmosis of Darling, periarteritis nodosa, chronic Brucella infection and some of the more rare splenomegalic diseases should one consider? I have neglected to add that a tonsillectomy was without effect on the course of this disorder and that all teeth have been x-rayed and seem normal.

M.D., Washington.

ANSWER.—Even the excellent description provided of this patient does not permit many more definite suggestions than those which have already been made by the inquirer. It is highly improbable that syphilis could be causing this picture, and much more likely that the illness is due to another cause which has produced false positive serologic reactions of the blood. In respect to syphilis and since the patient has suffered a cerebral vascular accident, it is of course essential to examine the spinal fluid—the one examination which does not appear yet to have been made. If the spinal fluid shows a positive Wassermann reaction, one may with much more certainty feel reasonably sure that the patient does have syphilis, even though this may not be the cause of her long continued febrile illness. False positive reactions in the spinal fluid produced by systemic infections (i. e. outside the nervous system) other than syphilis are exceedingly uncommon and probably do not occur.

One of the best recent articles on the diagnosis of unexplained long continuing fever is that of Hamman and Wainwright (*Bull. Johns Hopkins Hosp.* **58**:109 [Feb.], 307 [April] 1936). Among those causes which might conceivably produce a symptom complex such as the one described are brucellosis, tuberculosis, Hodgkin's disease, rheumatic fever, malignant tumor, tularemia, amebiasis and localized or generalized septic infections. Occasional instances of long continued fever may also be due to multiple sclerosis or in rare instances to hysteria or other psychogenic causes. These are of course in addition to periarteritis nodosa and histoplasmosis as named by the inquirer.

It would seem desirable to obtain a muscle biopsy to rule out periarteritis (and probably also trichiniasis, although this seems unlikely in view of the normal differential blood count) and in respect of brucellosis to have performed an opsonic index and cutaneous tests. Has an electrocardiogram been done? This might be helpful in respect to rheumatic fever.

If the symptom complex is due to syphilis, which seems the least likely of the possibilities enumerated, the fever, if not the other symptoms, should promptly disappear on the administration of bismuth and potassium iodide.

CRUSTING OF NASAL MUCOUS MEMBRANE AND EXPOSURE TO DUSTS

To the Editor:—A man aged 37 has a perforation of the nasal septum about 4 cm. long. He is in good health and has no complaints. The Wassermann reaction is negative. He has been in glass making for eight or ten years and has been exposed to the following chemicals:

	Percentages	
Sand	99 +	silicon dioxide
Soda ash	99 +	sodium carbonate
Salt cake	99	sodium sulfate
Limestone	99 +	calcium carbonate
Dolomite	54	calcium carbonate
	44	magnesium carbonate
Feldspar	20	aluminum oxide
	65	silica
	15	sodium and potassium oxides
Arsenic	96 +	arsenic trioxide
Coal		common blacksmith coal

Hydrochloric acid was used to dip the glass in formerly. He had three injuries to his nose about fifteen years ago, and one side was blocked for a long time afterward. Since the perforation has crusts and is a bit swollen and might be increasing in size, it would be desirable to find the cause. Are any of the chemicals named in dust form likely to have caused the trouble? What is the possibility of a cartilage having become dislocated to the extent of atrophy and sloughing? M.D., Arkansas.

ANSWER.—A concentration of any or all of the chemicals mentioned in the dust inhaled over a period of time could cause sufficient irritation and dryness of the nasal mucous membrane to predispose to crusting. This would undoubtedly be accelerated by the presence of a deviated septum resulting from previous trauma. The exposed angle of the fractured or luxated cartilage would be the point at which the crusting would first be manifest, and this would in time lead to ulceration and finally perforation of the septum. Continued exposure to dust laden air would only result in increased crusting about the margins of the perforation which increases in size from erosion. It is not uncommon to find the external nose red and swollen at times in cases of this sort and therapy would be only moderately successful as long as the man continues to work in the same atmosphere.

DELIVERY ON LEFT SIDE

To the Editor:—Can you give me any information with regard to left side delivery? I have been using this method for thirty years with rarely any perineal tears, much to the gratification of my patients. I should like to know of the experiences of other physicians using this method in order to improve on this method as I have worked it out.

Roy G. Perham, M.D., Hasbrouck Heights, N. J.

ANSWER.—The delivery of the patient on her left side was a favorite method some years ago. It is still quite popular in Great Britain. However, it is practiced today by few physicians in the United States. The abandonment of this position for delivery probably resulted from the fact that many primiparas have episiotomies prior to delivery.

WORK CONDITIONS OF PATIENTS WITH SILICOSIS

To the Editor:—Is it reasonably safe for a molder with second stage silicosis to continue working in the foundry which now uses a parting sand free from silica? The company indirectly claims that the silicosis is no more apt to progress under the present conditions than it would if the patient should be removed from the foundry entirely. M.D., Michigan.

ANSWER.—The advice to silicotic subjects about continuing work in their former occupations is governed by their age, local conditions in the plants and employment policies. From a strictly medical point of view, men over 45 who have developed silicosis slowly over a period of twenty or more years of exposure can return to work in a clean foundry without appreciable danger. Younger men and particularly those who have developed their silicosis within a period of five or six years are probably unusually "susceptible" to dust and should be removed to some other job. The legal aspects of the problem may necessitate removal of all silicotic persons from any further exposure regardless of its severity, for compensation officials may hold that exposures, however slight, are dangerous to preestablished silicosis. To permit the silicotic to work who are perfectly able to do so may create financial liabilities which the employer is unwilling to accept.

SEVERE PELVIC PAIN FROM INTERCOURSE

To the Editor:—I have treated a nullipara aged 38 for two years, mostly with ovarian injections and prescriptions of diethylstilbestrol, for the climacteric caused by radiation treatments at the age of 32. She is about over that condition but continues to have her chief complaint of severe pelvic pain on intercourse, which she claims appeared a year or so after the irradiation. At the age of 32 she claims to have had radium treatments inserted intravaginally for uterine hemorrhage, and one year later she had three weeks of x-ray treatments of fifteen minutes each on alternate days. She stopped flowing, lost the pubic and vulval hair and now has suprapubic and vaginal telangiectasis. Bimanual examination elicits a small uterus and excruciating pain into the center of the pelvis on pressure. The same pain is felt on pressure against a small closed cervix with a cotton ball on dressing forceps and is not lessened with the same procedure following cocainization of the cervix and vaginal vault. Is this pain due to a condition in the shrunken uterus or nerves in possibly taut broad ligaments? What could be done to relieve it?

L. S. Besson, M.D., Portland, Ore.

ANSWER.—The pain following irradiation is probably due to a parametritis. The scar tissue has formed in the parametria and when the uterus is moved pain is elicited. Heat applied by means of the Elliot apparatus may be helpful.

Possibly there is some atrophy of the vaginal mucosa which will respond to estrogen suppositories. Vaginal smears should aid in diagnosing this condition.

LENS SHAPES

To the Editor:—In Queries and Minor Notes in The Journal, September 18, there are several questions on lenses asked by Dr. H. W. Garton, the answers to which I think need a little revision. Dr. Garton asks "(4) Is there any advantage of a flat, clear lens over a curved clear lens? and (5) Must curved lens glasses be fitted more exactly in relation to the eye than a flat lens?" The answer to 4 and 5 contains these statements: ". . . because of the eyelashes, the curved glass goggles can be fitted closer to the eyes and give a greater field of vision" also ". . . we might state that a curved lens . . . is capable of rendering more space for eyelashes, thus permitting the goggle to be fitted close to exclude foreign matter."

The idea that a curved lens, i. e. one having a concave surface facing the eye, can be placed closer to the eye than a flat lens, i. e. one having a plano or convex surface facing the eye, is prevalent, but it is not quite correct. If a double convex spherical lens or a plano convex cylindric lens is placed before the eye and placed as close to the eye as the lashes will permit, making the lens in meniscus form with the concave surface facing the eye will not permit the lens to be set nearer to the eye. The distance of a lens from the eye is taken to be the distance from the apex of the cornea to the center of the posterior surface of the lens when the eye looks straight ahead. If the center of the lens just clears the lashes, then the center of any other lens, whatever its form, cannot be placed any nearer to the cornea. The meniscus form of a lens seems to be nearer to the eye because its concave inner surface follows partly the contour of the eye and sort of "hugs" the eye. The peripheral parts of a meniscus lens are nearer to the eye than the peripheral parts of a double convex or plano convex lens. The peripheral parts of the latter stand off from the eye and therefore such a lens rather than the meniscus "is capable of rendering more space for the eyelashes."

This communication is not intended to deny the superiority in general of the meniscus lens over the flat lens, though in some cases, as in some cataract lenses, it is preferable to use a flat plano convex or a flat compound (toric) type. The principal objective is to correct a widely held wrong notion which sometimes leads to other errors. For instance, if a trial lens which is double convex corrects an eye, then any lens, plano or meniscus, having the same vertex power will correct the eye if placed at the same distance from the cornea. If the trial lens is placed as close to the eye as the lashes will permit, the physician can safely prescribe that lens to be made up in meniscus form, and if this lens is also placed as close to the eye as the lashes will permit, this lens will have exactly the same effect as the trial lens. In the course of teaching physiologic optics I have come across many a doctor who was worried about prescribing a meniscus lens from his double convex trial lens because he had the idea that the former could be placed closer to the eye and would therefore lose in effectivity. Some would, on a hit or miss guess, add on a plus 0.25 spherical lens for this reason, only to find later that the lens was too strong. Joseph I. Pascal, M.D., New York.

IDENTIFICATION OF NEWBORN

To the Editor:—In The Journal, September 25, I noticed a question from D. H. Palmer, research engineer, Hospital Bureau of Standards and Supplies, New York, regarding methods of identification of newborn infants. I should like to call attention to research work of mine covering a period of two years beginning in 1932. This work was published in the *Illinois State Medical Journal* in April 1936, in *Fingerprint Magazine* in August 1936, in *Hospitals*, official publication of the American Hospital Association, in January 1937 and in the *Modern Hospital* in June 1936. In 1936 I demonstrated this method at the Scientific Exhibit of the American Medical Association in Cleveland and at the Illinois State Society convention at Springfield. Gilbert Palmer Pond, M.D., Oak Park, Ill.